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Williams et al.

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(54) **COMMUNICATION SYSTEM FOR ESTABLISHING AUTOMATED CALL BACK USING QUEUES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 174 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/620,048**

(22) Filed: **Sep. 14, 2012**

(65) **Prior Publication Data**

US 2013/0251139 A1 Sep. 26, 2013

Related U.S. Application Data

(63) Continuation of application No. 13/446,923, filed on Apr. 13, 2012, which is a continuation-in-part of application No. 12/320,517, filed on Jan. 28, 2009, now Pat. No. 8,213,911.

(51) **Int. Cl.**
H04M 3/42 (2006.01)
H04M 3/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04M 3/5231*** (2013.01); ***G06Q 10/02*** (2013.01); ***H04M 3/5238*** (2013.01); *H04M 2207/18* (2013.01)

(58) **Field of Classification Search**
CPC . H04M 3/5183; H04M 3/523; H04M 3/5238; H04M 3/42195; H04M 3/5231
USPC 379/210.01, 265.02, 265.11, 266.02, 379/266.07
See application file for complete search history.

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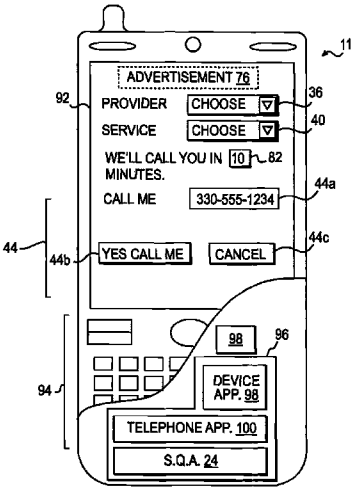
(Continued)

Primary Examiner — Nafiz E Hoque
(74) *Attorney, Agent, or Firm* — Davidson Berquist Jackson & Gowdey LLP; Aldo Noto

(57) **ABSTRACT**

A communication device is provided for enabling a user to establish an automated call back from a communication system, such as a call center, for example. A software device application enables the communication device to communicate with the call center through the exchange of data. The communication device includes a display screen for displaying controls for allowing the user to interact with the communication system. The controls allow the user to request a list of providers from which to select a provider or company to contact. The communication device further provides controls for allowing the user to select a queue to join from a list of queues associated with the selected provider. An embodiment may also communicate contextual data between a communication device and a communication system, including information associated with the user of the communication device and information used to assist, instruct, or solve a user's problem.

27 Claims, 17 Drawing Sheets



(51) **Int. Cl.**

H04M 5/00	(2006.01)
H04M 3/523	(2006.01)
G06Q 10/02	(2012.01)

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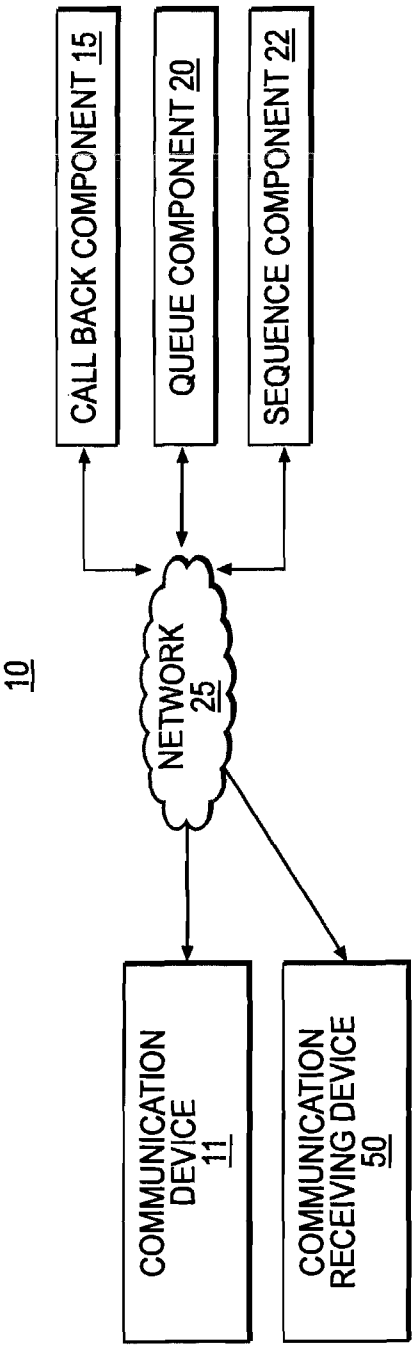
10
CALL BACK COMPONENT 15
QUEUE COMPONENT 20
SEQUENCE COMPONENT 22
NETWORK 25
COMMUNICATION DEVICE 11
COMMUNICATION RECEIVING DEVICE 50

FIG. 1A

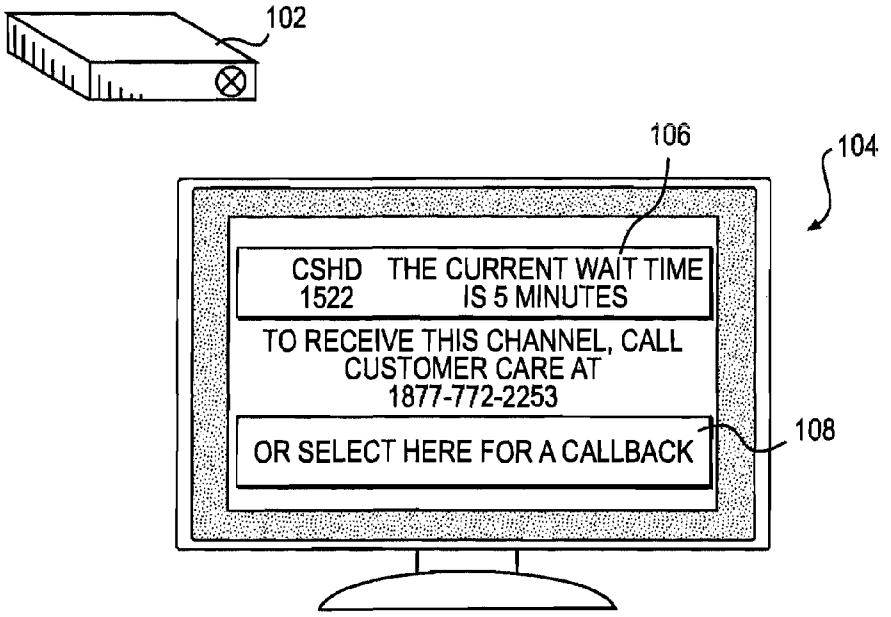
102
106
104
CSHD 1522
THE CURRENT WAIT TIME IS 5 MINUTES
TO RECEIVE THIS CHANNEL, CALL CUSTOMER CARE AT 1877-772-2253
OR SELECT HERE FOR A CALLBACK
108

FIG. 1B

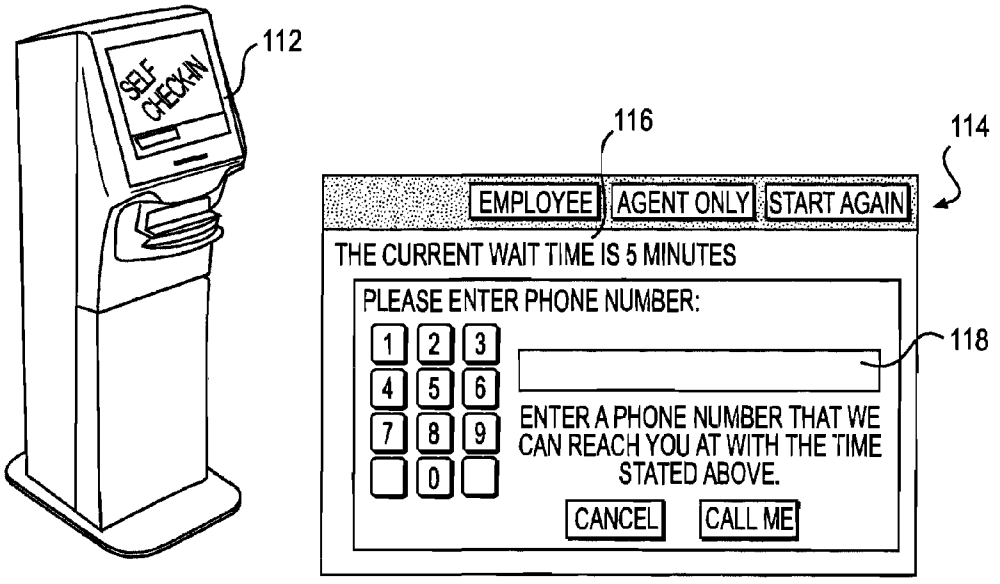
112
SELF CHECK-IN
116
114
EMPLOYEE
AGENT ONLY
START AGAIN
THE CURRENT WAIT TIME IS 5 MINUTES
PLEASE ENTER PHONE NUMBER:
1 2 3
4 5 6
7 8 9
0
118
ENTER A PHONE NUMBER THAT WE CAN REACH YOU AT WITH THE TIME STATED ABOVE.
CANCEL
CALL ME

FIG. 1C

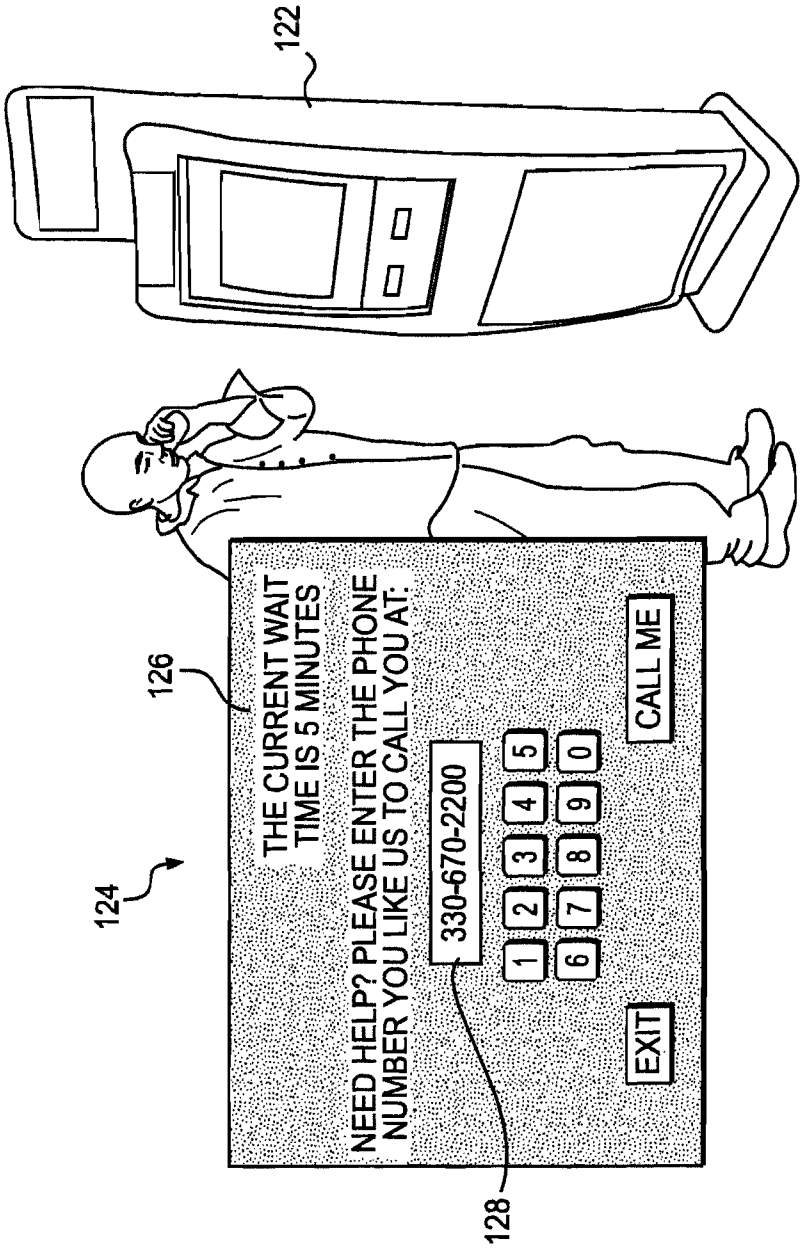
122
126
124
THE CURRENT WAIT TIME IS 5 MINUTES
NEED HELP? PLEASE ENTER THE PHONE NUMBER YOU LIKE US TO CALL YOU AT:
330-670-2200
1 2 3 4 5
6 7 8 9 0
CALL ME
EXIT
128

FIG. 1D

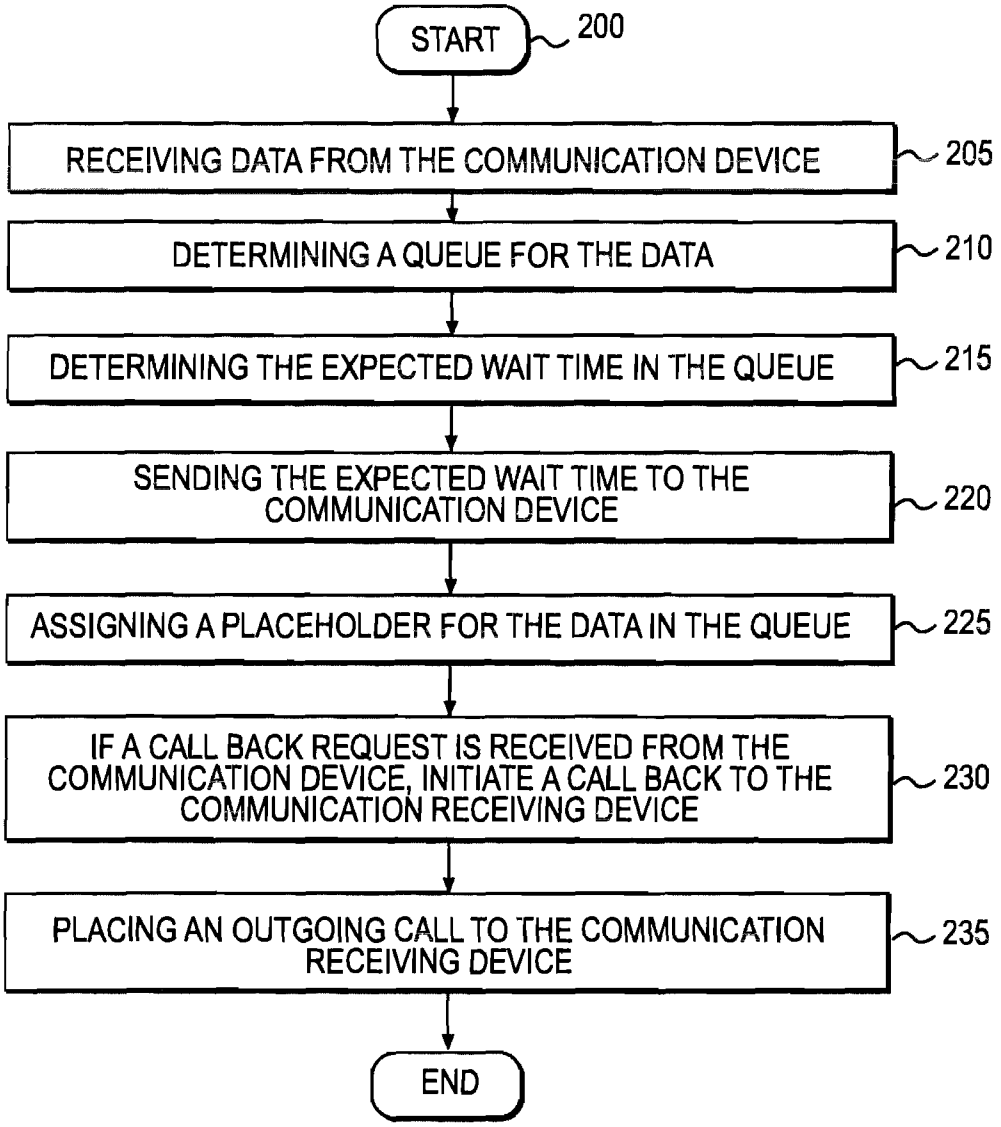
START
200
RECEIVING DATA FROM THE COMMUNICATION DEVICE
205
DETERMINING A QUEUE FOR THE DATA
210
DETERMINING THE EXPECTED WAIT TIME IN THE QUEUE
215
SENDING THE EXPECTED WAIT TIME TO THE COMMUNICATION DEVICE
220
ASSIGNING A PLACEHOLDER FOR THE DATA IN THE QUEUE
225
IF A CALL BACK REQUEST IS RECEIVED FROM THE COMMUNICATION DEVICE, INITIATE A CALL BACK TO THE COMMUNICATION RECEIVING DEVICE
230
PLACING AN OUTGOING CALL TO THE COMMUNICATION RECEIVING DEVICE
235
END

FIG. 2

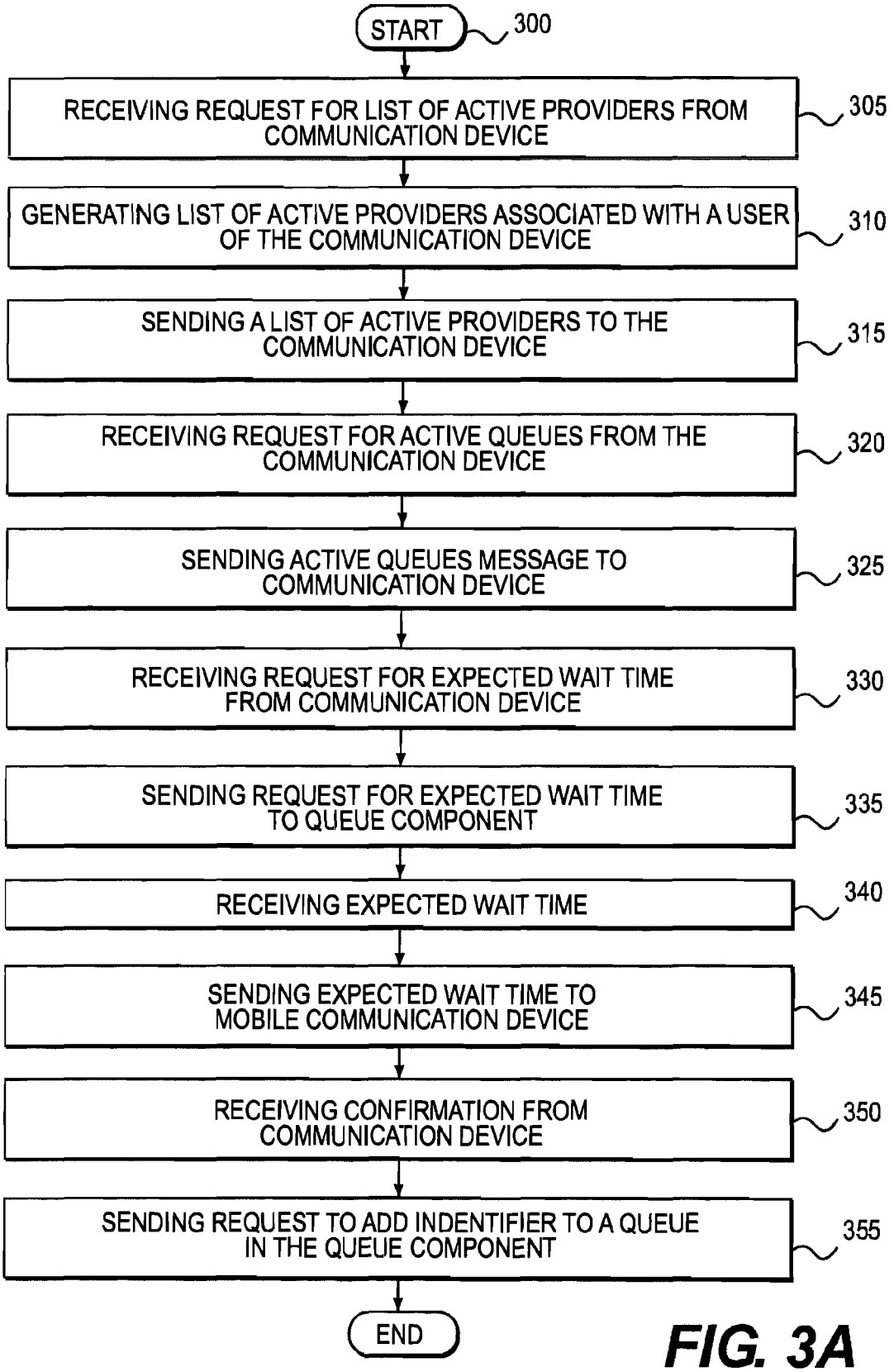
START
300
RECEIVING REQUEST FOR LIST OF ACTIVE PROVIDERS FROM COMMUNICATION DEVICE
305
GENERATING LIST OF ACTIVE PROVIDERS ASSOCIATED WITH A USER OF THE COMMUNICATION DEVICE
310
SENDING A LIST OF ACTIVE PROVIDERS TO THE COMMUNICATION DEVICE
315
RECEIVING REQUEST FOR ACTIVE QUEUES FROM THE COMMUNICATION DEVICE
320
SENDING ACTIVE QUEUES MESSAGE TO COMMUNICATION DEVICE
325
RECEIVING REQUEST FOR EXPECTED WAIT TIME FROM COMMUNICATION DEVICE
330
SENDING REQUEST FOR EXPECTED WAIT TIME TO QUEUE COMPONENT
335
RECEIVING EXPECTED WAIT TIME
340
SENDING EXPECTED WAIT TIME TO MOBILE COMMUNICATION DEVICE
345
RECEIVING CONFIRMATION FROM COMMUNICATION DEVICE
350
SENDING REQUEST TO ADD INDENTIFIER TO A QUEUE IN THE QUEUE COMPONENT
355
END

FIG. 3A

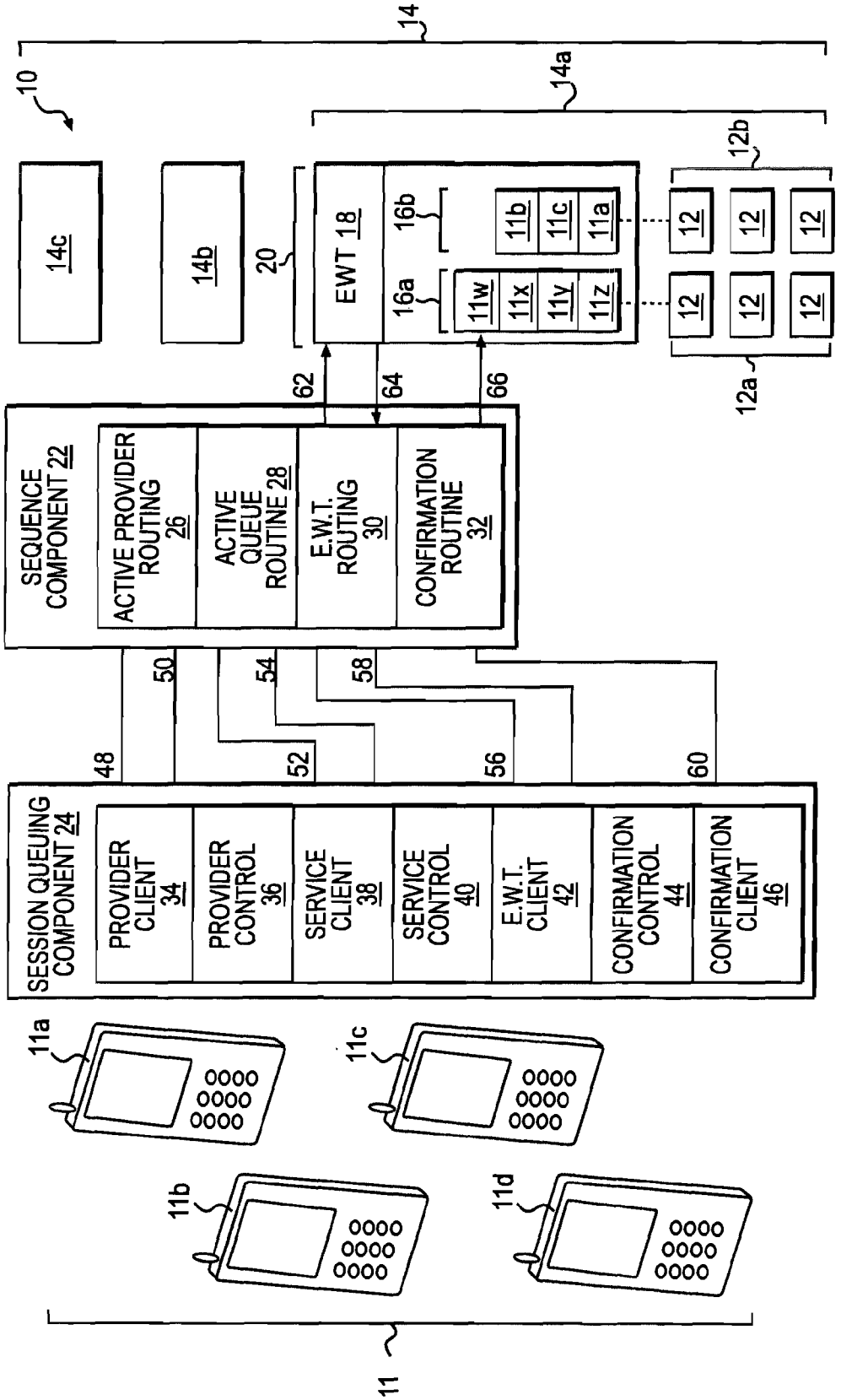
14
10
14a
14c
14b
20
EWT 18
16b
16a
11w
11x
11y
11z
11b
11c
11a
12b
12
12a
62
64
66
SEQUENCE COMPONENT 22
ACTIVE PROVIDER ROUTING 26
ACTIVE QUEUE ROUTINE 28
E.W.T. ROUTING 30
CONFIRMATION ROUTINE 32
48
50
52
54
56
58
60
SESSION QUEUING COMPONENT 24
PROVIDER CLIENT 34
PROVIDER CONTROL 36
SERVICE CLIENT 38
SERVICE CONTROL 40
E.W.T. CLIENT 42
CONFIRMATION CONTROL 44
CONFIRMATION CLIENT 46
11a
11c
11b
11d
11

FIG. 3B

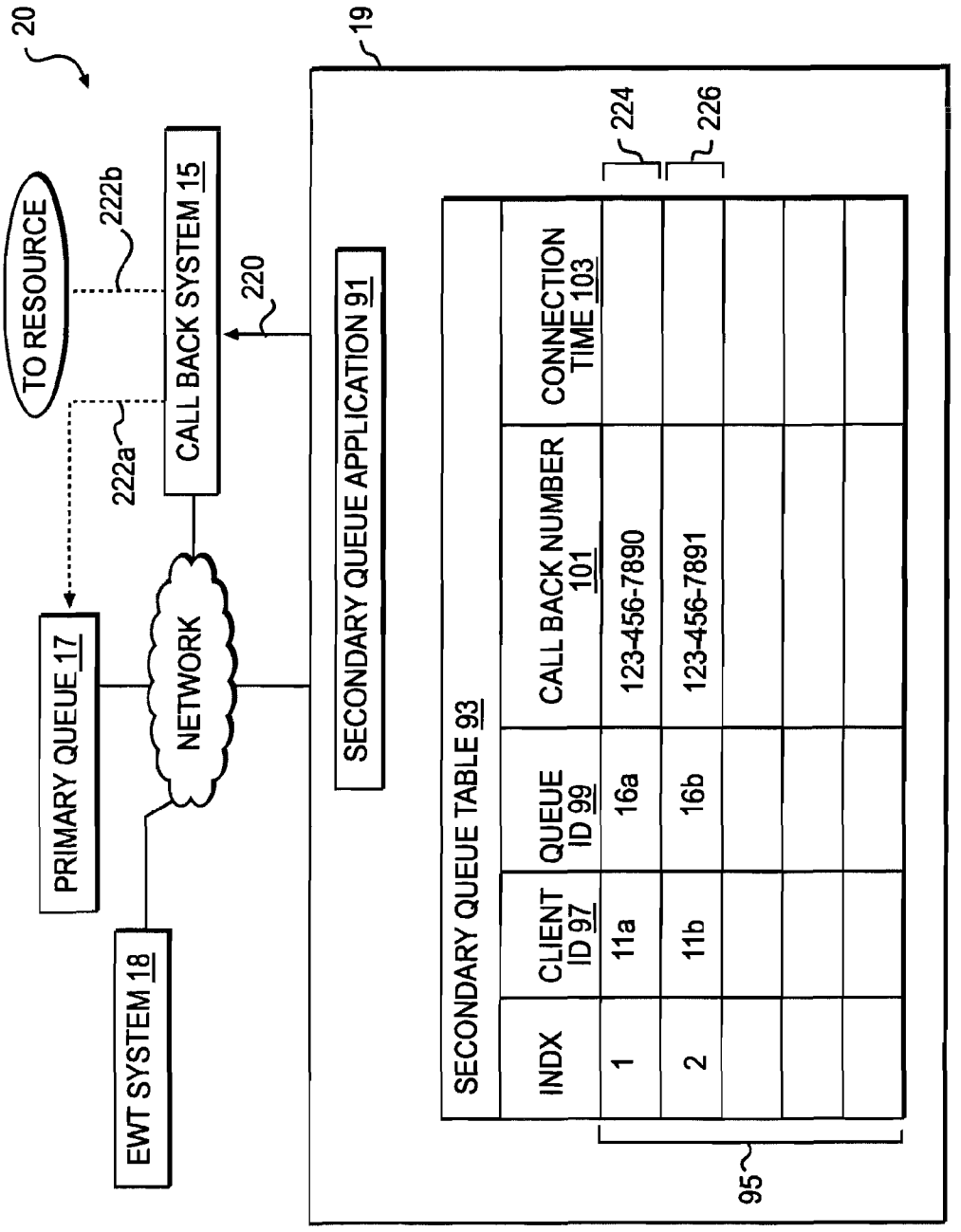
20
19
TO RESOURCE
222b
222a
CALL BACK SYSTEM 15
220
SECONDARY QUEUE APPLICATION 91
PRIMARY QUEUE 17
NETWORK
EWT SYSTEM 18
SECONDARY QUEUE TABLE 93
INDX
CLIENT ID 97
QUEUE ID 99
CALL BACK NUMBER 101
CONNECTION TIME 103
1
11a
16a
123-456-7890
2
11b
16b
123-456-7891
224
226
95

FIG. 4

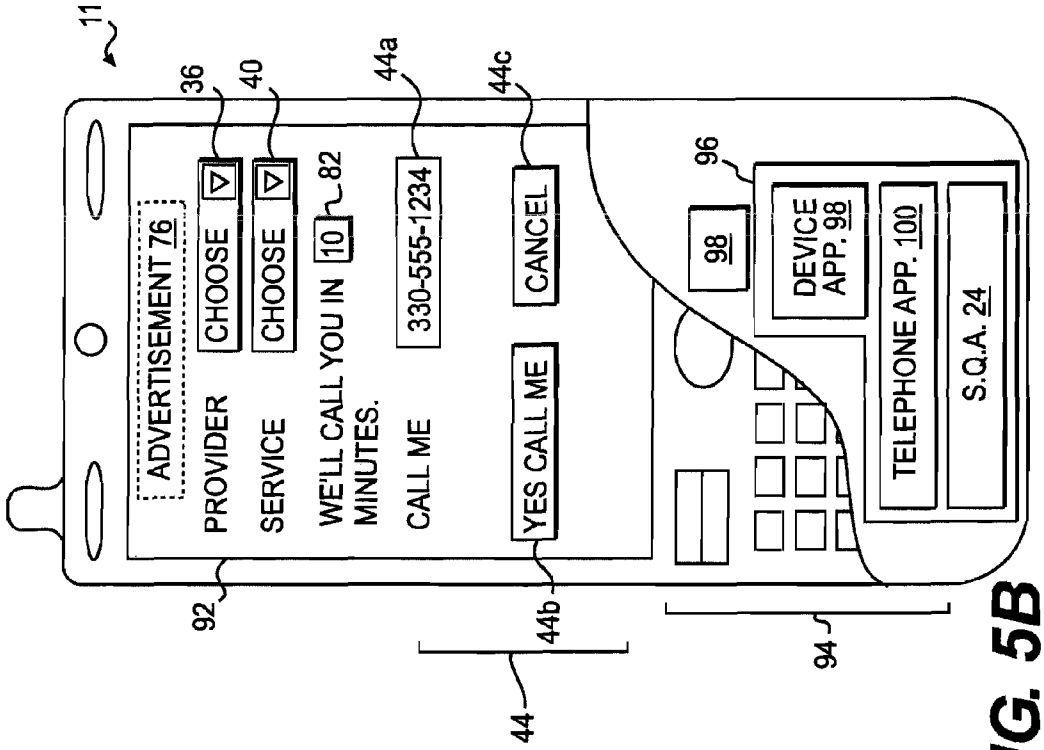
11
36
40
44a
44c
ADVERTISEMENT 76
PROVIDER
CHOOSE
SERVICE
CHOOSE
WE'LL CALL YOU IN 10 82
MINUTES.
CALL ME
330-555-1234
CANCEL
YES CALL ME
92
44b
44
96
98
DEVICE APP. 98
TELEPHONE APP. 100
S.Q.A. 24
94

FIG. 5B

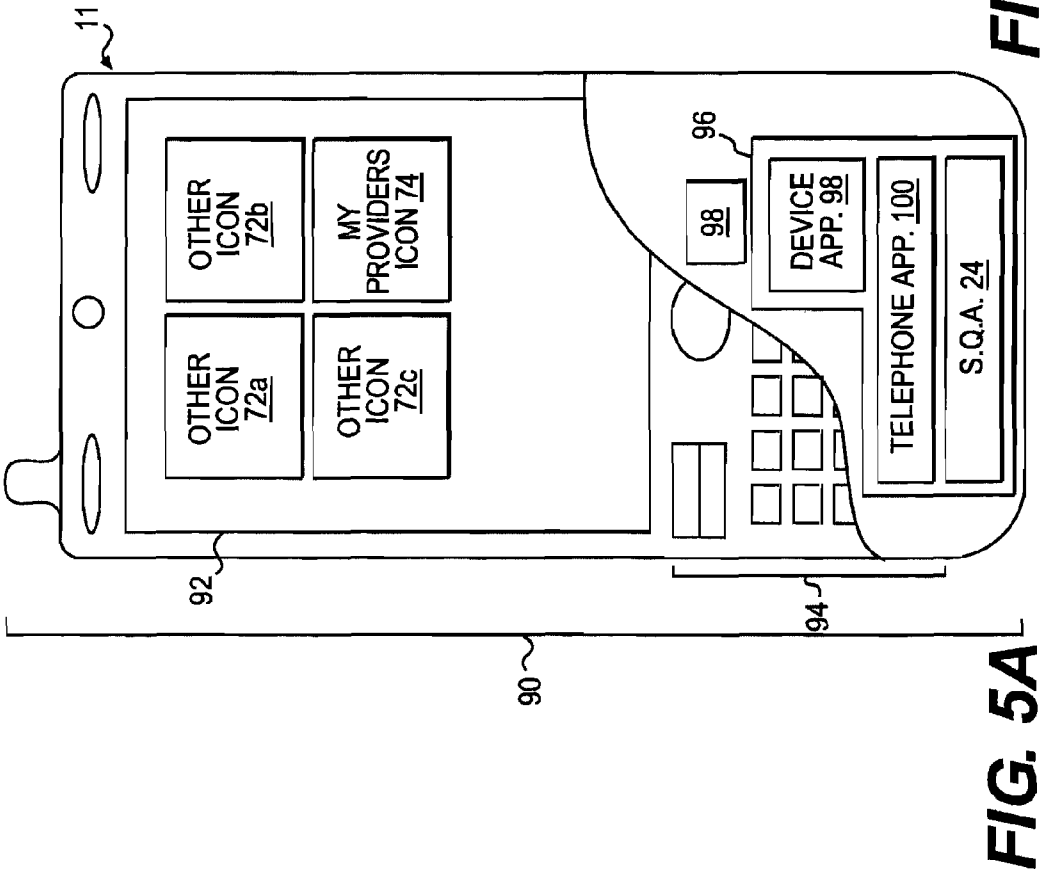
11
OTHER ICON 72b
MY PROVIDERS ICON 74
OTHER ICON 72a
OTHER ICON 72c
92
96
98
DEVICE APP. 98
TELEPHONE APP. 100
S.Q.A. 24
94
90

FIG. 5A

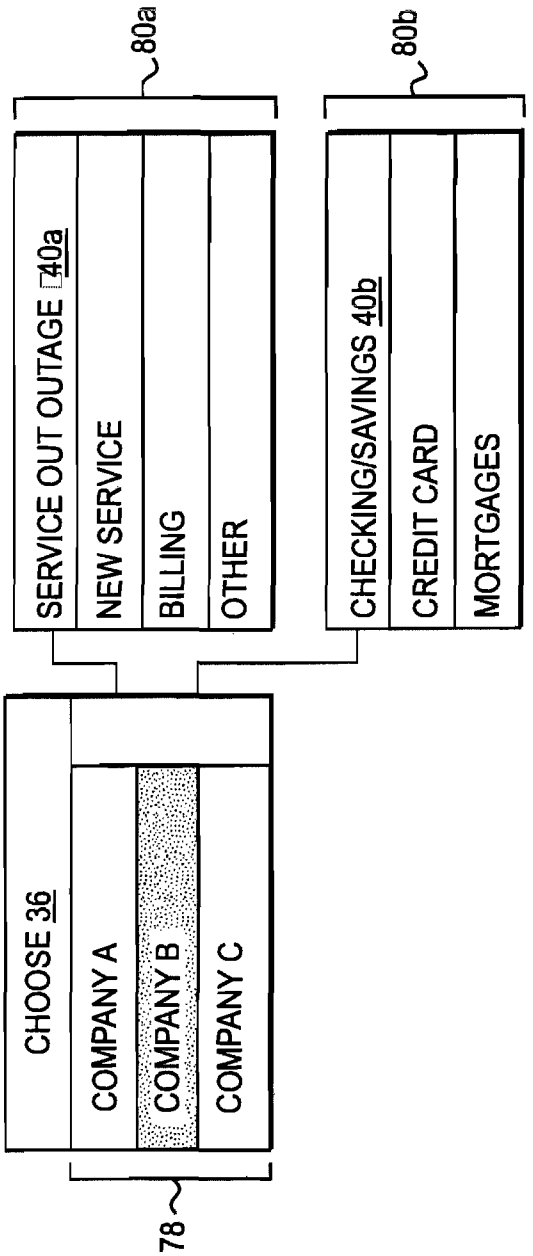
80a
80b
SERVICE OUT OUTAGE 40a
NEW SERVICE
BILLING
OTHER
CHECKING/SAVINGS 40b
CREDIT CARD
MORTGAGES
CHOOSE 36
COMPANY A
COMPANY B
COMPANY C
78

FIG. 6

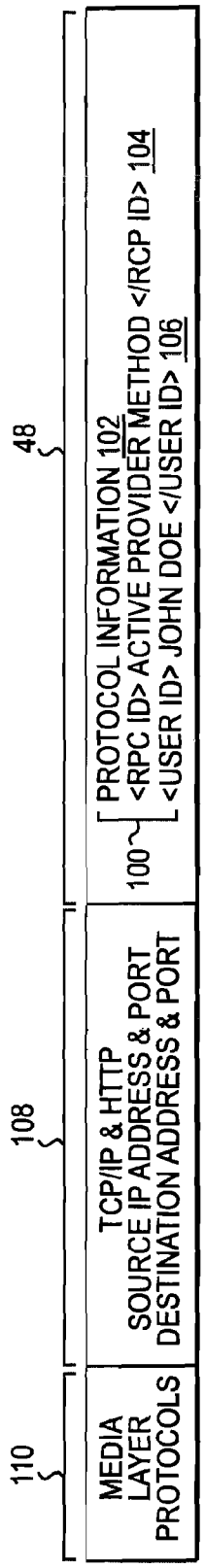

FIG. 7A

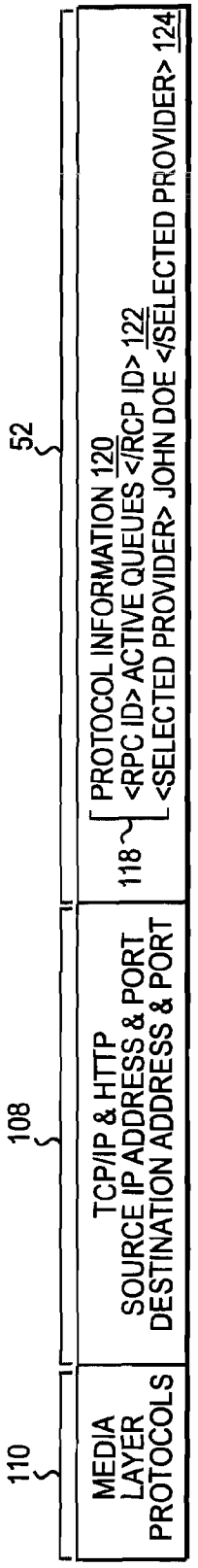

FIG. 7B

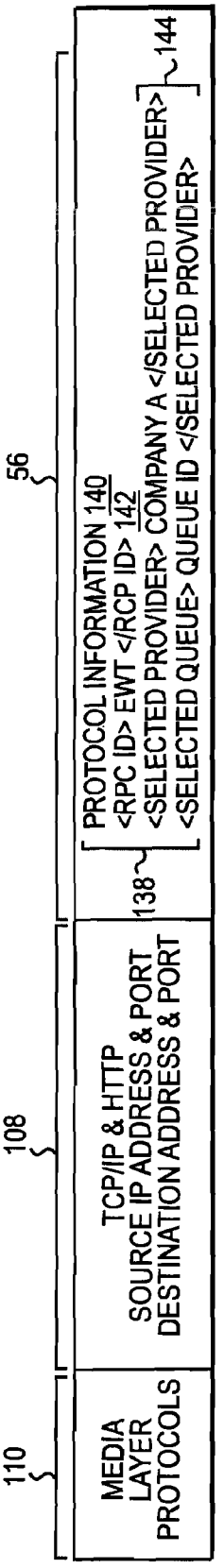

FIG. 7C

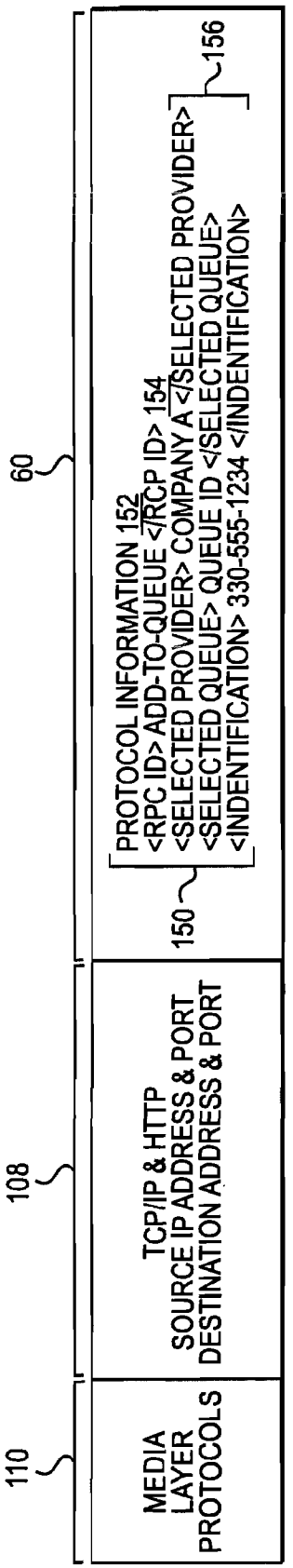
60
108
110
MEDIA LAYER PROTOCOLS
TCP/IP & HTTP
SOURCE IP ADDRESS & PORT
DESTINATION ADDRESS & PORT
150
PROTOCOL INFORMATION 152
<RPC ID> ADD-TO-QUEUE </RCP ID> 154
<SELECTED PROVIDER> COMPANY A </SELECTED PROVIDER>
<SELECTED QUEUE> QUEUE ID </SELECTED QUEUE>
<INDENTIFICATION> 330-555-1234 </INDENTIFICATION>
156

FIG. 7D

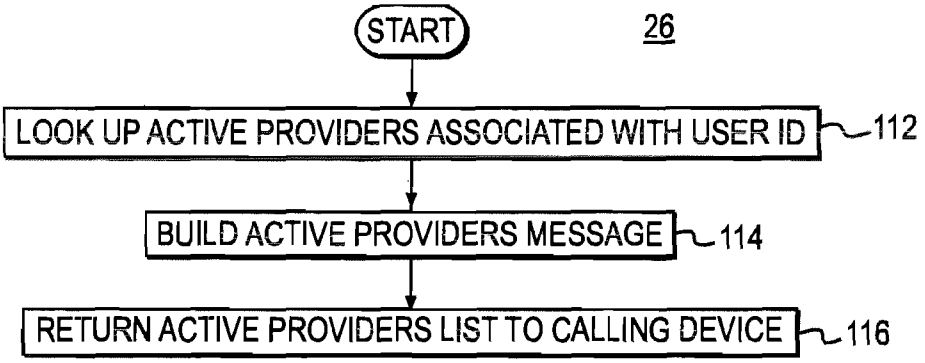

FIG. 8A

USER ID 204	ACTIVE PROVIDERS 206
JOHN DOE	COMPANY A, COMPANY B, COMPANY C
JANE DOE	COMPANY B, COMPANY C, COMPANY D
...	...

202 200

FIG. 8B

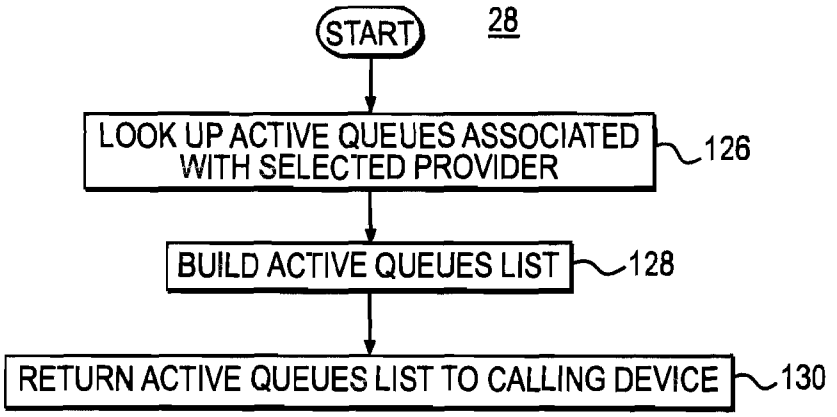

FIG. 8C

208

COMPANY ID 212	ACTIVE QUEUES 214
COMPANY A	SERVICE OUTAGE, NEW SERVICE, BILLING, OTHER
COMPANY B	CHECKING/SAVING, CREDIT CARD, MORTGAGES, OTHER
COMPANY C	NEW RESERVATION, EXISTING RESERVATION, ACCOUNT, OTHER
COMPANY D	SERVICE A, SERVICE, B, SERVICE C, OTHER

210

FIG. 8D

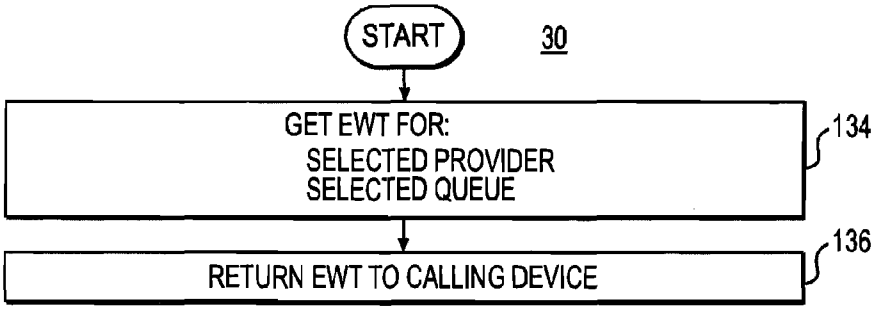

FIG. 8E

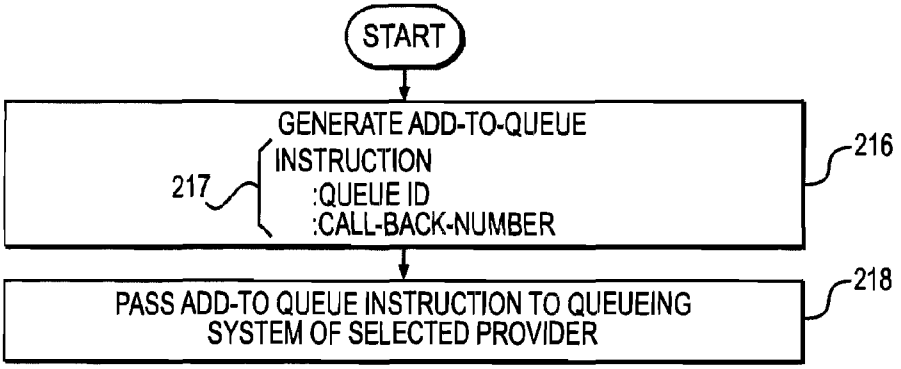

FIG. 8F

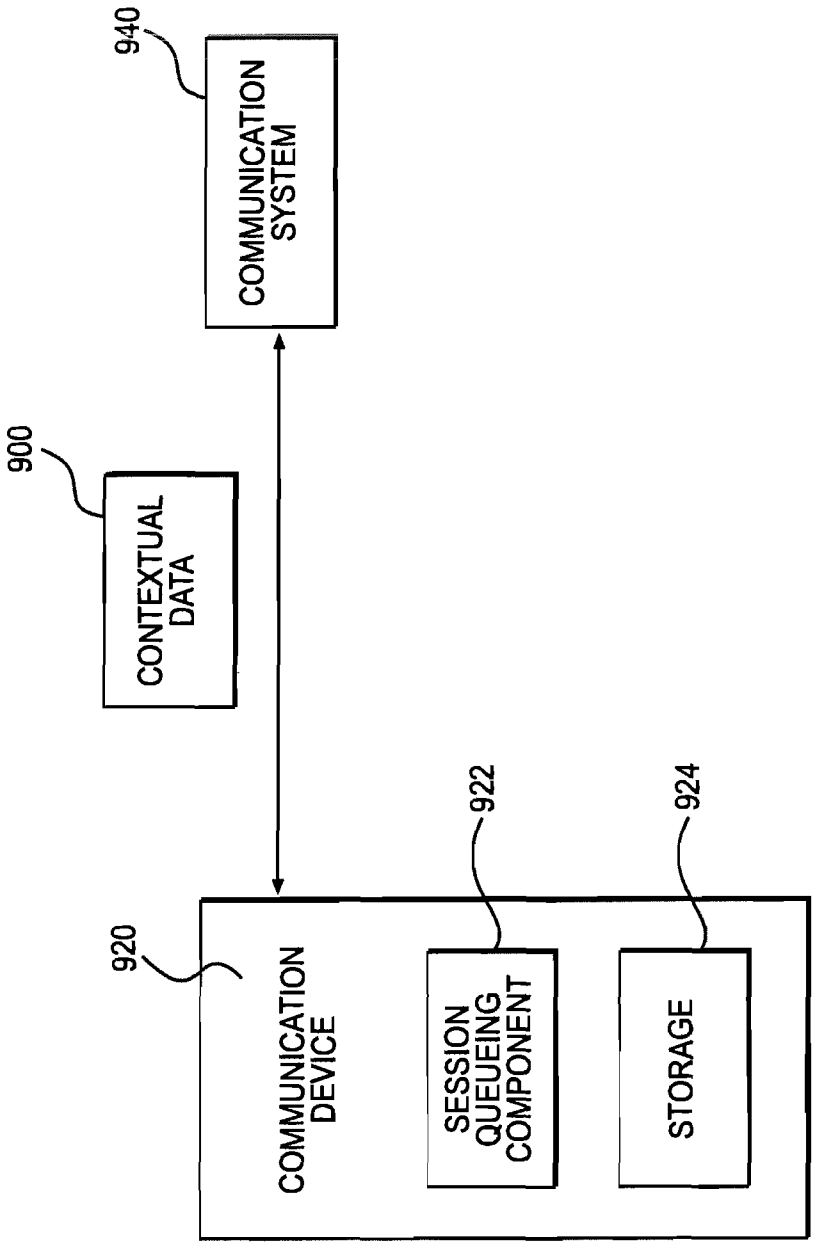
940
COMMUNICATION SYSTEM
900
CONTEXTUAL DATA
922
924
920
COMMUNICATION DEVICE
SESSION QUEUEING COMPONENT
STORAGE

FIG. 9

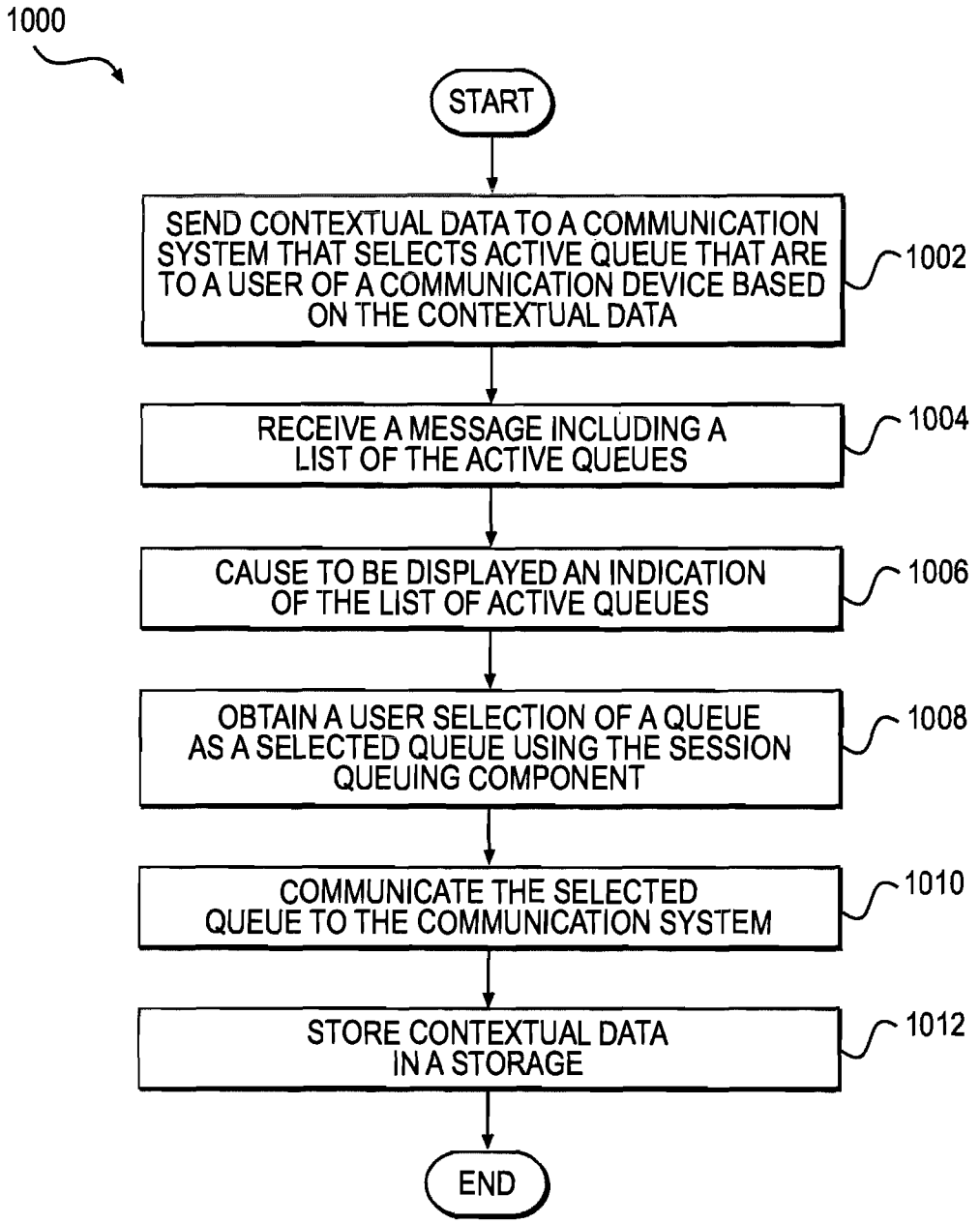
1000
START
SEND CONTEXTUAL DATA TO A COMMUNICATION SYSTEM THAT SELECTS ACTIVE QUEUE THAT ARE TO A USER OF A COMMUNICATION DEVICE BASED ON THE CONTEXTUAL DATA
1002
RECEIVE A MESSAGE INCLUDING A LIST OF THE ACTIVE QUEUES
1004
CAUSE TO BE DISPLAYED AN INDICATION OF THE LIST OF ACTIVE QUEUES
1006
OBTAIN A USER SELECTION OF A QUEUE AS A SELECTED QUEUE USING THE SESSION QUEUING COMPONENT
1008
COMMUNICATE THE SELECTED QUEUE TO THE COMMUNICATION SYSTEM
1010
STORE CONTEXTUAL DATA IN A STORAGE
1012
END

FIG. 10

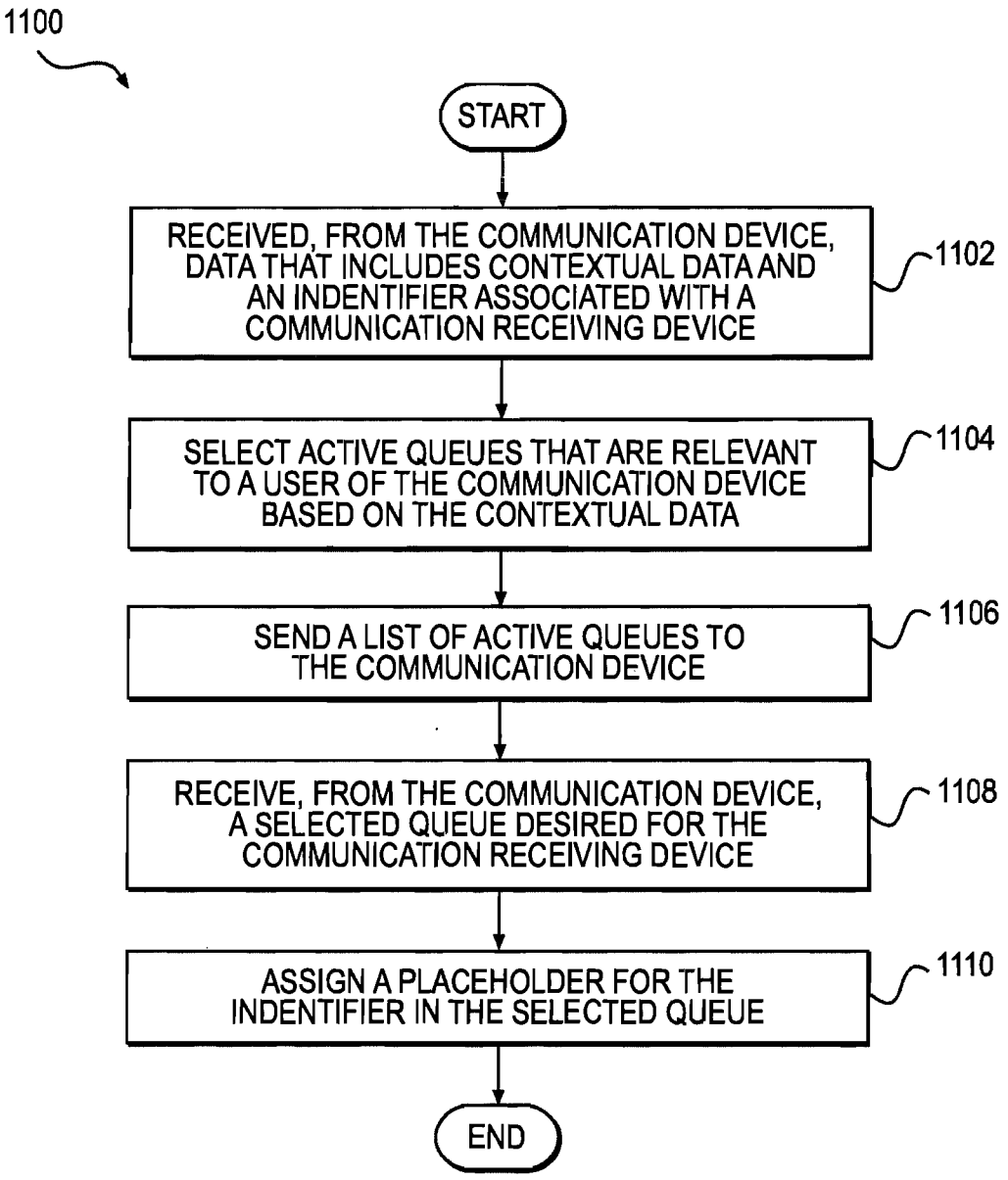
1100
START
RECEIVED, FROM THE COMMUNICATION DEVICE, DATA THAT INCLUDES CONTEXTUAL DATA AND AN INDENTIFIER ASSOCIATED WITH A COMMUNICATION RECEIVING DEVICE
1102
SELECT ACTIVE QUEUES THAT ARE RELEVANT TO A USER OF THE COMMUNICATION DEVICE BASED ON THE CONTEXTUAL DATA
1104
SEND A LIST OF ACTIVE QUEUES TO THE COMMUNICATION DEVICE
1106
RECEIVE, FROM THE COMMUNICATION DEVICE, A SELECTED QUEUE DESIRED FOR THE COMMUNICATION RECEIVING DEVICE
1108
ASSIGN A PLACEHOLDER FOR THE INDENTIFIER IN THE SELECTED QUEUE
1110
END

FIG. 11

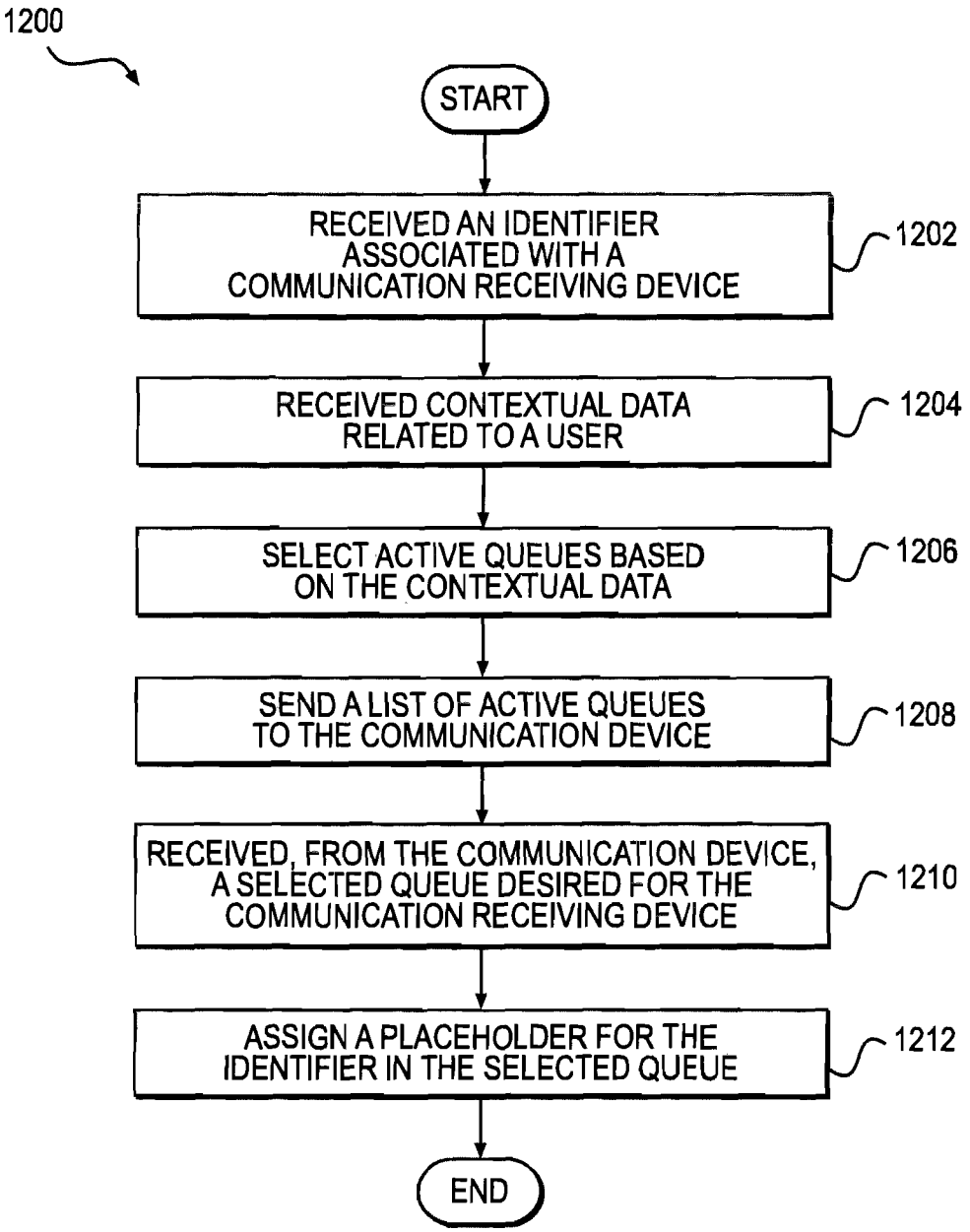
1200
START
RECEIVED AN IDENTIFIER ASSOCIATED WITH A COMMUNICATION RECEIVING DEVICE
1202
RECEIVED CONTEXTUAL DATA RELATED TO A USER
1204
SELECT ACTIVE QUEUES BASED ON THE CONTEXTUAL DATA
1206
SEND A LIST OF ACTIVE QUEUES TO THE COMMUNICATION DEVICE
1208
RECEIVED, FROM THE COMMUNICATION DEVICE, A SELECTED QUEUE DESIRED FOR THE COMMUNICATION RECEIVING DEVICE
1210
ASSIGN A PLACEHOLDER FOR THE IDENTIFIER IN THE SELECTED QUEUE
1212
END

FIG. 12

COMMUNICATION SYSTEM FOR ESTABLISHING AUTOMATED CALL BACK USING QUEUES

RELATED APPLICATION

This application is a continuation of U.S. application Ser. No. 13/446,923, filed on Apr. 13, 2012, entitled "COMMUNICATION DEVICE FOR ESTABLISHING AUTOMATED CALL BACK USING QUEUES," which is a continuation-in-part application of U.S. application Ser. No. 12/320,517, filed on Jan. 28, 2009, entitled "A MOBILE COMMUNICATION DEVICE FOR ESTABLISHING AUTOMATED CALL BACK," issued on Jul. 3, 2012 as U.S. Pat. No. 8,213,911, both of which are hereby incorporated by reference herein in their entireties.

TECHNICAL FIELD

The systems and methods relate to managing the queuing of clients waiting to be connected by telephone to a service agent of a business communication center. More particularly, the systems and methods relate to enabling clients to be added to a queue utilizing web service messaging and relate to establishing a telephony connection between clients and service agents on an automated basis and in an order maintained by a queue.

BACKGROUND

Many businesses use groups of service representatives for communicating with clients who initiate communications with the business, such as by telephone calls. To most efficiently use the time and skills of each service representative, the service representatives may be organized into groups based on a skill set. For example, the groupings may be based on the representatives ability to handle client issues such as the opening of new accounts, billing issues and customer service issues on existing accounts.

Typically, if a client calls such a business, voice prompt menu choices enable the calling client to identify the issue for which the client requires service and the client is then queued for a service agent capable of handling the identified issue. As such, it is expected that clients who identify the purpose of their call as a "billing issue" will be queued for, and connected to, a service representative with the ability to handle billing issues. Similarly, it is expected that clients who identify the purpose of their call as a "customer service issue" will be queued for, and connected to, a service representative with the ability to handle customer service issues.

There are problems with existing communications systems, such as contact centers, including the following two problems. First, the voice prompt menus that are used to channel callers to the queue for the appropriate group of service agents are exacerbating to a client at best. It takes significant time to navigate the layered menus of voice prompts. Second, waiting on-hold while the telephone connection is maintained in queue for connection to a service agent is also exacerbating to a client at best.

In an effort to reduce customer exacerbation caused by having to maintain a connection while on-hold in queue, secondary queue systems have been developed. A typical secondary queue system obtains a telephone number at which the calling client can be reached when a service representative is available (i.e., a call back number). The client disconnects, and then, at the proper time, a call back system establishes a connection to the client utilizing the call back number and couples the client to an available representative without waiting on-hold in queue. One exemplary system is disclosed in U.S. Pat. No. 6,563,921 to Williams et al. which is commonly assigned with the present application.

While such a system may make the experience of waiting for a connection to a service representative slightly less exacerbating, it does not address the inconvenience of having to navigate an irritatingly slow and usually complicated voice prompt menu to enter the queue.

Therefore, what is needed is: i) a method and system for adding clients to a queue in a more convenient manner; and ii) a method and system for establishing a telephony connection between the client and the service agents in an automated fashion.

SUMMARY

In an embodiment, a method for a communication system that receives incoming communications from a communication device, has queues, and will call-back to a communication receiving device is used. The method includes receiving data from the communication device (where the data includes an identifier associated with a communication receiving device) and determining, from the received data, a queue desired for the identifier, where the queue is a service agent queue. The method further includes (a) determining the expected wait time in the queue, (b) sending information to the communication device, where the information includes the expected wait time in the queue, and (c) assigning a placeholder for the identifier in the queue. If a call back request is received from the communication device, the method includes initiating a call back to the communication receiving device based upon the assigned placeholder in the queue and placing an outgoing telephone call to the communication receiving device.

Also, a method for use in a system that receives incoming communications from a communication device and will queue a call back is described.

In an embodiment, a communication system for receiving incoming communications from communication devices and for initiating a call-back includes a sequence component that initiates a call-back sequence to a communication receiving device. In this embodiment, the sequence component is in communication with a communication device and, based on the communication, the sequence component determines a queue and confirms a call back. The system further includes a queue component having more than one queue, where a placeholder is assigned for an identifier associated with the communication receiving device in the determined queue. The system also includes an expected wait time component for determining the expected wait time in the determined queue. The expected wait time is provided to the sequence component and the sequence component communicates information regarding the expected wait time to the communication device. The system of this embodiment further includes a call-back component for placing an outgoing call to the communication receiving device, where the sequence component prompts the call back component to place the outgoing call.

In addition, a computer-readable medium including instructions for initiating a call-back sequence is described.

In an embodiment, a communication device for initiating a call-back sequence includes a display screen, a processor for executing a device application and a memory for storing the device application. The device application includes a queue control, where the queue control displays, on the screen, an indication of a queue and obtains a user selection of the queue

as a selected queue. The device application further includes an expected wait time client, where a sequence component sends an expected wait time services call and receives an indication of the expected wait time, and where the expected wait time services call includes identification of the selected queue. The device application also includes a confirmation control to display, on the screen, the indication of the expected wait time where a user selection of one of a confirmation command and a cancel command is obtained. The device application includes a confirmation wait time client that generates a confirmation services call to the sequence component in response to user selection of the confirmation command, the confirmation services call includes at least a communication receiving device identifier and an instruction to add the communication device identifier to the selected queue.

A computer readable medium including instructions for a communication device to initiate a call-back sequence in a communication system is also described.

In addition to requesting an expected wait time and call-back from the communication system, an embodiment of a system and method for managing, directing, and queuing communication events may also communicate contextual data between a communication device and a communication system using, for example, a contextual data routine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is a block diagram representing an exemplary architecture of a system for sequencing communication devices in a selected queue of a selected provider;

FIG. **1**B illustrates an embodiment of the system that uses a home entertainment device to initiate a telephone connection and/or callback;

FIG. **1**C illustrates an embodiment of the system that uses a kiosk, e.g., a boarding pass kiosk at an airport, to initiate a telephone connection and/or callback;

FIG. **1**D illustrates an embodiment of the system that uses a point of purchase device to initiate a telephone connection and/or callback;

FIG. **2** is a flow-chart of a method for call back sequencing;

FIG. **3**A is a flow-chart of a method for assigning a placeholder in a queue for a call back to a communication device;

FIG. **3**B is a block diagram representing an exemplary architecture of a system for sequencing communication devices in a selected queue of a selected provider;

FIG. **4** is a block diagram of an exemplary queue component;

FIG. **5**A is an exemplary communication device adapted for operation;

FIG. **5**B is an exemplary communication device adapted for operation in accordance with an exemplary embodiment of the present invention;

FIG. **6** is a table representing an exemplary provider control and an exemplary service control in accordance with an exemplary embodiment of the present invention;

FIGS. **7**A-**7**D represent exemplary messaging structures packaged with transport layer and media layer information;

FIG. **8**A is a flow chart representing exemplary operation of an active providers service or method in accordance with an exemplary embodiment of the present invention;

FIG. **8**B is an exemplary active providers data storage in accordance with an exemplary embodiment of the present invention;

FIG. **8**C is a flow chart representing exemplary operation of an active queues service or method in accordance with an exemplary embodiment of the present invention;

FIG. **8**D is an exemplary active queues data storage in accordance with an exemplary embodiment of the present invention;

FIG. **8**E is a flow chart representing exemplary operation of an expected wait time service or method in accordance with an exemplary embodiment of the present invention;

FIG. **8**F is a flow chart representing exemplary operation of an ad-to-queue method in accordance with an exemplary embodiment of the present invention;

FIG. **9** illustrates an embodiment of the system that communicates contextual data between a communication device and a communication system;

FIG. **10** is a flow chart illustrating an embodiment of a method for use with a communication device for initiating a call-back for selecting a voice call-back;

FIG. **11** is a flow chart illustrating an embodiment of a method for a communication system that receives incoming communications from a communication device, has queues, and will call-back to a communication receiving device; and

FIG. **12** is a flow chart illustrating another embodiment of a method for a communication system that receives incoming communications from a communication device, has queues, and will call-back to a communication receiving device.

DETAILED DESCRIPTION

The present invention will now be described in detail with reference to the drawings. In the drawings, each element with a reference number is similar to other elements with the same reference number independent of any letter designation following the reference number. In the text, a reference number with a specific letter designation following the reference number refers to the specific element with the number and letter designation and a reference number without a specific letter designation refers to all elements with the same reference number independent of any letter designation following the reference number in the drawings.

It should also be appreciated that many of the elements discussed in this specification may be implemented in a hardware circuit(s), a processor executing software code which is encoded within computer readable media accessible to the processor, or a combination of a hardware circuit(s) and a processor or control block of an integrated circuit executing machine readable code encoded within a computer readable media. As such, the term circuit, module, server, or other equivalent description of an element as used throughout this specification is intended to encompass a hardware circuit (whether discrete elements or an integrated circuit block), a processor or control block executing code encoded in a computer readable media, or a combination of a hardware circuit(s) and a processor and/or control block executing such code.

It should also be appreciated that the table structures represented in this application are exemplary only and intended to show the mapping of relationships between various data elements. Other table structures may store similar data elements in various manners. Further, the applicant's use of the term "plurality" is intended to indicate not just "at least one", but one, two, three, or any other quantity. The applicant's use of the term "group" is intended to indicate not just "at least one", but two, three, or more of the items within the group.

FIG. **1**A is a high level schematic illustration of a system **10** for placing a communication device **11** in a queue and calling a communication receiving device **50**. The system **10** includes the communication device **11**, a network **25**, a call back component **15**, a queue component **20**, a sequence component **22**, and the communication receiving device **50**.

The system **10** assigns a placeholder for a communication device **11** (or an identifier for a communication device **11** such as its telephone number or other unique network identifier) in a selected queue (not shown in FIG. **1**) of the queue component **20**. The system uses a sequence component **22** to execute a call back sequence to a communication receiving device **50**. When prompted, the call back component **15** places an outgoing call to a communication receiving device **50**. The outgoing call attempts to establish a voice connection with the communication receiving device **50**.

The communication receiving device **50** may be any device that can receive a telephone call. The communication receiving device **50** is often the communication device **11** that sent the initial data requesting a telephone connection.

In some embodiments, prior to allowing communication between a communication device **11** and the system **10**, the system **10** performs one or more security checks. These security checks can be performed for a variety of purposes including to ensure that the software on the communication device **11** is authentic and valid for use on the device and that the device is authorized. Various software routines may be used by the system **10** and the communication device **11** to perform security checks. Encryption keys may be assigned to the communication devices **11** and used for the security check.

In an embodiment, the identifier for a communication device **11** is an encryption key. Each software application for communicating with the system **10** on a communication device **11** may have one or more unique encryption keys that are recognized by the system **10**.

The network **25** (depicted by a cloud) can be any one or more of a variety of networks. The system **10** shown can support many communication devices **11** of various types and many queues (not shown in FIG. **1**). The communication device **11** may communicate with the other components through the network using available techniques.

The communication device **11** may be a mobile communication device using cell phone, wi-fi, satellite or other mobile communication technology. The communication device may take the form of any mobile device such as a cellular telephone, a tablet, or a laptop. The communication device **11** may also be a non-mobile device, such as a home entertainment device, a kiosk, a computer, or a point of purchase device, as shown in FIGS. **1**B-**1**D.

FIG. **1**B illustrates an embodiment of the system **10** that uses a home entertainment device **102** (e.g., a set top box, a television, a cable box, a gaming console, a digital video disk (DVD) player or some combination) to initiate a telephone connection and/or callback. In the embodiment shown in FIG. **1**B, the communication device **11** is a home entertainment device **102**. The home entertainment device **102** is typically connected to a display **104**. The display **104** is used to show queues, phone numbers, company names, a companies services departments or the like. The display **104** may display a number to call in order to receive a particular program or to access a particular channel from a cable company, for example. The display **104** may display an expected wait time **106**. The display **104** may also display a box **108** that allows a user to select and enter a phone number for a callback. After the expected wait time (or an approximately equivalent time) has passed, the system **10** places an outgoing call to a communication receiving device (not shown) having the phone number provided by the user. The home entertainment device **102** may optionally include a remote control (not shown) to navigate callback menus that provide a list of queues and their expected wait time, if any exist. Other user interface devices and software can be used with the home entertainment system.

FIG. **1**C illustrates an embodiment of the system **10** that uses a kiosk **112**, e.g., a boarding pass kiosk at an airport, to initiate a telephone connection and/or callback. In this embodiment, the communication device **11** is the kiosk **112**. The kiosk **112** typically includes a display **114** that shows an expected wait time **116** for a requested telephone connection. The display **114** may also display a box **118** that allows a user to enter a phone number for a callback. After the expected wait time (or an approximately equivalent time) has passed, the system **10** places an outgoing call to a communication receiving device (not shown) having the phone number provided by the user.

FIG. **1**D illustrates an embodiment of the system **10** in which the communication device **11** is the point of purchase device **112**. The point of purchase device **122** may take various forms e.g., a cell phone plan purchase device. In this embodiment, the point of purchase device **122** is used to initiate a telephone connection and/or callback. The point of purchase device **122** typically includes a display **124** that shows an expected wait time **126** for a requested telephone connection. The display **124** may also display a box **128** that allows a user to enter a phone number available for a callback. After the expected wait time (or an approximately equivalent time) has passed, the system **10** places an outgoing call to a communication receiving device (not shown) having the phone number provided by the user. Alternatively, a microphone and speaker may be provided at the point of purchase location or on the point of purchase device **122**.

Referring now to FIG. **2**, shown is a flow chart of an exemplary embodiment of a method for initiating a call-back sequence in a communication system, such as a call center or contact center, for example. The method **200** includes receiving data from a communication device **11** (**205**), determining a queue for the data (**210**), determining the expected wait time in the queue (**215**) for the data and sending the expected wait time in the queue to a communication device **11** (**220**). The method further includes assigning a placeholder for the data in the queue (**225**). If a call back request is received from the communication device **11**, the method includes initiating a call back to a communication receiving device **50**. The method further includes placing an outgoing call to a communication receiving device **50** (**235**). The steps of the method may be performed in various different orders or chronology.

As noted above, the communication receiving device **50** may be any device that can receive a telephone call. The communication receiving device **50** is often the communication device **11** that sent the initial data requesting a telephone connection.

FIG. **3**A is a flow chart of an embodiment of a method **300** for assigning a placeholder in a queue for a call back to a communication device **11** in a communication system. The description of the method **300** in FIG. **3**A also references components and routines found in FIG. **3**B. The method **300** of FIG. **3**A includes the sequence component **22** receiving a request for a list of active providers from a communication device **11**. This may be in the form of an active provider remote processing call **48** from a provider client routine **34** (**305**). The provider client **34** is a routine which is part of the session queuing component **24**. The active provider remote processing call **48** originates from the communication device **11** and serves as the request for a list of active providers. The active providers may be associated with a user of the communication device **11**. Upon receipt of the active provider remote processing call **48**, the sequence component **22**

launches an active provider routine **26**. The routine generates a list of active providers associated with the user (**310**) of the communication device **11**.

The method **300** further includes active provider routine **26** sending a list of active providers to the communication device **11** via an active providers message **50**. More particularly, the provider client routine **34** in the session queuing component **24** receives active providers message **50** (**315**).

The method **300** further includes receiving a request for active queues in the queue component **20** via an active queue remote processing call **52** from the communication device **11** (**320**). The active queue remote processing call **52** serves as a request for a listing of active queues associated with the selected provider to an active queue routine or process **28** of the sequence component **22**. The listing is populated into the service control **40** of the session queuing component **24**.

The exemplary method **300** of FIG. **3**A further includes sending active queues, via an active queues message **54**, from active queue routine **28** to service client routine **38**. The service client routine **38** in this example is resident on the communication device **11** (**325**). The active queues message **54** includes active queues wherein an identifier of a communication device **11** may be placed.

The method **300** further includes receiving a request for the expected wait time for receiving a call back from a provider. The expected wait time may be received via an expected wait time call **56** from the communication device **11** (**330**). Upon the user selecting a queue using the service control **40**, the expected wait time client **42** generates an expected wait time call **56** to the sequence component **22**. The method **300** includes the expected wait time routine **30** sending a request **62** for the expected wait time to the expected wait time component **18** (within the queue component **20**) (**335**) and receiving the expected wait time **64** (**340**) from the expected wait time component **18**.

With continuing reference to FIG. **3**A, the method **300** further includes sending an expected wait time message **58** to the communication device **11** (**345**). More particularly, the expected wait time message **58** is sent from the expected wait time routine **30**, of the sequence component **22**, to an expected wait time client **42** of the session queuing component **24**. The method **300** further includes receiving a confirmation call **60** from the communication device **11**. More particularly, the confirmation call originates from confirmation client **46** (part of the session queuing component **24**) and is sent to the confirmation routine **32** (**350**) of the sequence component **22**. The method **300** further includes sending a request via a message **66** to the queue component **20** to add user's identifier to the selected queue (**355**).

FIG. **3**B is a schematic diagram of an embodiment of a telephone based system **10** showing multiple communication devices **11***a*-**11***d* and multiple business communication centers **14***a*-**14***c*. Each business communication center **14***a*-**14***c* is typically associated with a company for which the business communication center **14***a*-**14***c* is operated. The system **10** includes sequence component **22** and a session queuing component **24**. The sequence component **22** performs the call back sequencing of the communication devices **11***a*-**11***d*. The session queuing component **24** resides within a communication device **11** and can be loaded onto each communication device **11***a*-**11***d*.

With continuing reference to FIG. **3**B, each business communication center (using business communication center **14***a* for reference) may be associated with a company and comprise a group of service agents **12**. Each of the service agents **12** may be a service representative system for enabling a service representative to service a client. More specifically, the service representative may participate in an audio session with a communication device **11** and service the requests of each client, or routine, of the session queuing component **24**. The service agents **12** may be organized in a single service agent set grouped into multiple service agent sets based on the skill set of service agent operators (e.g., the operators of the service agents **12** at a communication system).

In an embodiment, the business communication center **14***a* has at least one computer system including a processor operating the queue component **20**, and memory. In general, the queue component **20** is adapted to maintain a group of queues **16***a*, **16***b* with each queue **16***a*, **16***b* being associated with one of sets **12***a*, **12***b* of the group of service agents **12**. For example the set of service agents **12***a* may be associated with queue **16***a* while the second set of service agents **12***b* may be associated with queue **16***b*.

In an embodiment, the queue component **20** identifies a sequential order of the devices **11***w*, **11***x*, **11***y*, and **11***z*, which are queued for connection to one of the service agents **12**.

Expected wait time component **18** is adapted to determine an expected wait time value representing the time at which service agents **12** within the particular service agent group are expected to be available to service a client. The expected wait time can be calculated or determined in a number of different ways.

The expected wait time value may represent an estimated wait time calculated using primary estimated wait time techniques such as projecting a wait time based on the quantity of clients in the queue and any of a historical, present, or projected time allotment for handling each such queued client. Alternatively, the expected wait time value may be a function of both a primary estimated wait time calculation and a wait time augmentation calculation made based on service agent availability and/or scheduled change in service agent availability as disclosed in co-pending patent application Ser. No. 11/143,857 filed on Jun. 2, 2005 and assigned to the same assignee as the present invention. Such patent application is incorporated herein by reference.

The sequence component **22** may be embodied as a web services server. In one embodiment, the sequence component is connected to the internet and includes appropriate web services messaging systems (i.e., Simple Object Access Protocol or SOAP) for communicating with the session queuing component **24** on the devices **11***a*-**11***d*. In an embodiment, the sequence component **22** communicates with queue component **20**.

The sequence component **22** may include a processor (not shown) for executing the web services messaging systems as well as other applications stored on a memory (not shown). Such other applications may comprise an active provider routine **26**, an active queue routine **28**, an expected wait time routine **30**, and a confirmation routine **32**.

The session queuing component **24** may include a number of routines including for example, a provider client **34**, a company or provider control **36**, a queue or service client **38**, a queue or service control **40**, an expected wait time client **42**, a confirmation control **44** and a confirmation client **46**.

It should be appreciated that each of the routines of the session queuing component **24** are exemplary and for illustrative purposes. Those skilled in the art will recognize that the systems and functions of each routine described herein may be implemented by way of other permutations of components and sub systems.

In an embodiment, the session queuing component **24** may be an embedded application of a communication device **11**. In another embodiment, the session queuing component may be a java script, ActiveX, or other similar structure downloaded

and executed by a browser and an applicable browser plug-in executing on the telephone **11**. In this embodiment, the session queuing component **24** may include a combination of the java script or ActiveX control and components of the browser and/or the plug-in, which in combination drive operation of the session queuing component **24**.

In an embodiment, the session queuing component **24** communicates with the sequence component **22** using web service messages and internet protocol. In an embodiment, the session queuing component **24** obtains user selection of a provider (from a group of providers) with which the user desires to communicate via a telephone communication session. The session queuing component **24** may also obtain user selection of a service of the selected provider (from a group of services) and an estimated wait time representing a duration of time the user can be expected to wait until connecting to the selected services. Session queuing component **24** confirms, after presenting the expected wait time to the user, that the user desires to connect to a service agent **12**. More specifically, it confirms that the user wishes to speak with a particular type of service agent **12**. The session queuing component **24** assists in placing the user in a queue for the user to receive a call back from the service agent **12** at a connection time.

The connection time may be when the user reaches the first position in the queue (i.e., after other clients in the selected queue prior to the client have all been connected to available service agents or abandoned their position in the queue selected) and a service agent becomes available, or at a specific scheduled time. The specific scheduled time may be a time calculated by adding the expected wait time to the time at which the expected wait time was presented to the user. The specific scheduled time may also be a time selected by the user.

The term "provider" is used interchangeably with the term "business communication center" or the "provider's business communication center" within this application, and the term "queue" is used interchangeably with the term "service" or the "queue for connection to a service agent providing the selected service."

FIG. **4**, is a block diagram of an embodiment of queue component **20**. The queue component **20** may include primary queue **17** (ACD) adapted to queue communication devices **11** while maintaining the telephony connection (e.g., communication devices "on-hold"), a secondary queue component **19**, a call back component **15** adapted to establish a telephony connection to communication device **11** for which a telephony connection is not maintained by the primary queue **17**, and an expected wait time component **18**.

The primary queue **17** may be embodied in a primary automated call director (ACD). In an embodiment, the ACD places in a queue client telephone connections which are "on-hold" waiting for a service agent **12**. Such an ACD may use known technology adapted to (1) receive incoming calls from the communication device **11** (e.g., establishing a client connection with each) (2) identify which group of service agents the caller desires to connect (including using primary voice prompts) and (3) place the call in a queue for connection to the identified service agent group. If one of the service agents **12** within a service agent group becomes available, the ACD connects a next client connection from the queue to the available service agent **12**.

The secondary queue component **19** may be coupled to a primary queue **17** as an accessory device. The secondary queue component **19** maintains the queue position of the communication device **11** in a manner that does not require the communication device **11** to remain "on hold" or otherwise maintain an active telephone connection with the primary queue **17**. More specifically, for a communication device **11** calling the communication center utilizing the primary queue **17**, the secondary queue component **19** may (1) obtain a network address for the communication device **11** (e.g., a telephone network call back telephone number or other telephone network address) and (2) write the network address of the telephone connection to a record of the queuing table (for example record **224** in the event a user of communication device **11***a* calls the communication center in a primary manner). Further, the secondary queue component **19** may, at the appropriate connection time, (3) induce the call back system **15** to establish a connection to the communication device **11** utilizing the call back number. Inducing the call back system **15** to establish the connection may include generating a call back message **220** to the call back system **15**.

The secondary queue component **19** may also (e.g., communication devices **11** being added to a queue utilizing telephone system **10**), obtain a network address of a telephone connection to the communication device **11** (e.g., a telephone network call back telephone number or other telephone network address) via the messaging discussed above with respect to messages **62**, **64**, and **66** in FIG. **3**B. The secondary queue component **19** may write the network address of the telephone connection to a record of the queuing table (for example record **226** in the event a user of communication device **11***b* utilizing system **10** for being added to queue **16***a*), and at the appropriate connection time, induce the call back system **15** to establish a connection to a communication device **11** utilizing the call back number. Inducing the call back system **15** to establish the connection may include generating a call back message **220** to the call back system **15**. The call back message **220** may include identification of the telephone number to which the call back system **15** is to establish a telephone connection and identifying the queue **16***a*, **16***b* and/or service agent group **12***a*, **12***b* to which the telephone connection is to be connected.

After the call back system **15** has established a connection with the communication device **11**, it may generate a priority connection to the available service agent **12** within the appropriate service agent group **12***a*, **12***b*.

The priority connection **222** may be a transfer **222***a* of the communication device **11** connection to the primary queue **17**. Transfer **222***a* may occur via a command such that the primary queue **17** connects the client to the next available one of the service agents **12** within the required service agent group **12***a*-**12***b* (e.g., places the client at the front of the queue). The priority connection **222** may also be a connection **222***b* directly to the next available service agent **12**, bypassing primary queue **17**.

The secondary queue system **19** may comprise a secondary queue application **91** and a secondary queue table **93**. The secondary queue table **93** maintains, for each communication device **11** being handled by the secondary queue component **19**, call back information. In more detail, secondary queue table **93** may comprise a plurality of records **95**. Each record **95** associates a client identifier **97** with a call back telephone number **101** (or other network identifier) to which a telephone connection may be established with the subject communication device **11**, or other communication receiving device **50** at a connection time **103**. Secondary queue table **93** may also include a service agent ID **99** identifying the service agent **120**, or subset of the group of service agents to which the client **11** is to be connected.

In one aspect, the secondary queue application **91** monitors the passage of time and, upon determining that time has advanced to the connection time **103** of one of the records **95** of the secondary queue table **93**, drives the call back system

15 to establish a telephony connection to the subject client. Again, the telephony connection may be a primary PSTN connection or a telephony connection using an alternative technology such as VoIP.

After establishing the telephony connection, the priority connection to a service agent **12** within the required service agent group is generated.

The expected wait time component **18** may be part of the secondary queue system **19**, part of the primary queue (ACD) **17**, or a separate accessory system interoperating with the secondary queue system **19** and the primary queue (ACD) **17**.

Referring now to FIG. **5**A, each device **11** may include user interface **90** inclusive of display screen **92** and controls **94** (such as keys, touch panel, or other controls) for operation of controls rendered on the display screen (keys are represented), memory **96**, and processor **98** for executing applications encoded in the memory **96**.

The applications encoded in memory **96** may include a telephone application **100**, and/or appropriate systems adapted to drive operation of the user interface, and the session queuing component **24**.

The telephone application **100** may be adapted to signal, establish, and maintain an audio communication session (either as the session initiator or receiver) with remote endpoint devices over compatible networks (PSTN, VoIP, and other networks utilized for audio communication sessions). The endpoint devices include the business communication center systems **14** for signaling, establishing, and maintaining audio communication sessions between each service agent **12** and the business clients, each of which may utilize one of the communication devices **11** for communication with the business.

The session queuing component **24** may include a launch object **74** rendered as a "My Providers" icon on the display screen **92** and adapted to launch operation of the session queuing component **24** upon detecting user selection of the launch object **74**.

Referring now to FIG. **5**B, for purposes of performing the above described functions, visible objects of the session queuing component **24** (following activation by selection of the launch icon **74** as depicted in FIG. **5**A) include a provider control **36**, a service control **40**, and a confirmation control **44**.

The confirmation control **44** may include a window **44***a* for confirming the identifier of a communication device **11** (i.e., the call back telephone number utilized to establish an inbound telephone call to the communication device **11** or other unique "call back" identifier used to establish an audio session with the communication device **11**), an accept control object **44***b* and a cancel control object **44***c*.

In an exemplary embodiment, the telephone number of the communication device **11** may be pre-populated to the window object **44***a* with the window object being active to enable the user to modify the telephone number in the event he or she desires the call back to be at a different telephone station.

The cancel control object **44***c* may be a selection button adapted to detect user selection. Upon detecting user selection, cancel control object **44***c* may be adapted to terminate operation of the session queuing component.

The accept control object **44***b* may be a selection button adapted to launch the confirmation client **46** upon user selection.

Upon launch of the session queuing component **24** the visible objects of the session queuing component **24** may be rendered on the display screen **92** as depicted in FIG. **5**B.

The provider control **36** may be rendered in an active state with the group of providers **78** (FIG. **6**) populated into its drop down menu. From this menu, the user may select providers from the selected business communication center. The service control **40** is shown in an active state. The service control **40** and the confirmation control **44** may be rendered in an inactive state (i.e., rendered with no populated data, inoperable, and rendered with a gray tint to indicate the inactive state). In an embodiment, the provider client **34** (shown in FIG. **3**B) populates the provider control **36** with a listing of the providers from the group of providers **78**.

Referring now to FIG. **6**, shown is an illustration of the provider control **36**. The provider control **36** may be a drop down menu control which displays a group of providers **78**. From this menu, the user may select a provider from the selected business communication center.

The service control **40** may be a drop down menu control (as represented by **40***a*, **40***b*) which displays, for the selected provider, the services/queues of a group of services/queues **80***a*, **80***b* associated with the selected provider's business communication center. A user may select a service from this menu.

Exemplary providers include Company A and Company B. For purposes of illustration, Company A may be a utility company and its services/queues associated with its business communication center may include a service/queue for reporting loss of services, a service/queue for handling billing matters, and a default service/queue for handling other matters.

Company B, for illustration, may be a bank and its services/queues associated with its business communication center may include a service for handling of checking, savings, or other deposit accounts, a service for handling credit card accounts, a service for handling mortgage accounts, and a default service for handling other matters.

FIG. **7**A, shows an exemplary embodiment of a structure for communications or messages passing between the communication devices **11** and service providers. In this example, the structure of an active providers remote processing call **48** is shown. The structure may be an XML structure **100** with applicable SOAP or other remote processing call protocol information **102**. The exemplary structure includes at least a method identifier **104**, which identifies the active provider routine or process **26** as the remote process, and data arguments **106** for the active provider routine **26**. The data arguments **106** may include at least identification of the user.

The remote processing call **48** may be encapsulated within appropriate TCP/IP and HTTP headers and other transport layer information **108** such as source IP address and source port number of the requesting device **11** and destination IP address and destination port number of the sequence component **22**. Such combination may be encapsulated within appropriate media layer protocols **110** for transmission across physical communication media via various physical layer segments interconnecting the requesting device **11** and the sequence component **22**.

FIGS. **7**B-**7**D show exemplary structures of other messages or communications within system **10** similar to that of active providers remote processing call **48**. The other communications that may be similarly structured, encapsulated, and transported may include the active queue remote processing call **52** (FIG. **7**B), expected wait time call **56** (FIG. **7**C), add-to-queue remote processing call **154**, the active providers message **50**, the active queue message **54**, the expected wait time message **58**, and the confirmation remote processing call **60** (FIG. **7**D), for example.

More specifically, referring to FIG. **8**A and FIG. **8**B, the active provider routine **26** includes a looking up (at step **112**) in an active providers data store **200**, a list of active providers

associated with the user. The active providers data store **200** and may include a group of records **202**, with each record associating a user ID **204** with identification of a group of active providers **202** associated with the user ID **204**. Step **114** represents building an active providers message **50** (shown in FIG. **3**A) for return to the device generating the active providers remote processing call **48** (shown in FIG. **3**A).

It should be appreciated that the above described structure and processes for populating the provider control **36** is exemplary only. Those skilled in the art will also recognize that the list of providers could be obtained and stored within the communication device **11**. A list of providers stored within the communication device **11** may then be used for populating both the provider control **36** and the active queue control **40**. Upon a user selecting a provider from the list of active providers **78** rendered or shown within the provider control, the service client routine **38** requests a listing of active queues from the active queue routine or process **28** of the sequence component **22**. The service client routine **38** populates the service control **40** with a listing of active queues associated with the selected provider.

More specifically, referring to FIG. **8**C and FIG. **8**D, the active queue routine or process **28** includes looking up (at step **126**) in an active queues data store **208**, a list of active queues associated with the selected provider. The active queues data store **208** may include a group of records **210**, with each record associating a company ID **212** (identifying a provider) with identification of a group of active queues **214** associated with the company ID **212**. The build active queues list (step **128**) represents building an active queues message **54** (described above) for return to the device generating the active queue remote processing call **52** (described above).

Upon receipt of the active queues message **54**, by service client routine **38**, the service control **40** is populated by the list of active queues **80***a* as discussed with respect to FIG. **5**B and FIG. **6**.

It should be appreciated that the above described structure and processes for populating the service control **40** is exemplary only. Those skilled in the art will also recognize that lists of active queues for each provider could be obtained and stored within the communication device **11** utilizing one or more remote processing calls prior to user selection. As such, list of providers and active queues stored within the communication device **11** may then be used to populate both the provider control **36** and the active queue control **40**. It is further envisioned that both the provider control **36** and the service control **40** may be combined within a single control listing combinations of a provider and a service.

More specifically, referring to FIG. **8**E, the expected wait time routine or process **30** includes obtaining (at step **134**) from the expected wait time component **18** associated with the selected queue of the selected provider, the expected wait time for the selected queue. Such step may include sending a remote processing call to the expected wait time component with data arguments (of the remote processing call) including identification of the selected queue. The return expected wait time to calling device (step **136**) represents the expected wait time component **18** building an expected wait time message **58**. The expected wait time message can then be sent to the device generating the expected wait time remote processing call **56**.

Referring back to FIG. **5**B, upon receipt of the expected wait time response message **58**, the expected wait time value **148** identifying the expected wait time duration of time is rendered on the display screen as depicted by reference numeral **82**. Following display of the identification of the duration of time, the confirmation control **44** may be activated for obtaining user input.

As discussed, the confirmation control may include a window **44***a* for confirming a telephone number of the communication device **11** or the communication receiving device **50** (i.e., the telephone number utilized to establish an inbound telephone call to the communication device **11** or the communication receiving device **50**), a confirmation control **44***b* and a cancel control **44***c*.

In an exemplary embodiment, the telephone number of the communication device **11** may be pre-populated to the window object **44***a* with the window object being active to enable the user to modify the telephone number in the event he or she desires the call back to be at a different telephone station, such as the communication receiving device **50**.

The cancel control **44***c* may be a selection button adapted to detect user selection. Upon detecting user selection, the cancel control object may be adapted to terminate operation of the session queuing component.

The accept control object **44***b* may be a selection button adapted to launch the confirmation client **46** upon user selection.

The confirmation client **46** (shown in FIG. **3**A) may be adapted to send a confirmation remote processing call **60** to the sequence component **22** via the message structure described above. In this instance, the data arguments may include at least the identification of a telephone number or other telephone network address of the communication receiving device **50** or communication device **11** that the user desires for use in the connection to the service agent. Typically such identification will be a PSTN telephone number that the provider systems will use as a "call back number" to establish a telephone connection between the user and a service agent at the appropriate call back time.

Further, the arguments of the confirmation remote processing call may include identification of the selected provider and selected queue which the user desires to join. Alternatively, the arguments may include a session ID matched to previous remote processing calls such that the sequence component may determine the selected provider and selected queue which the user desires to join.

More specifically, referring to FIG. **8**F, the confirmation routine or process **32** includes (at step **216**) generating an add-to-queue instruction **217**. The instruction may include for example, a queue ID of the selected queue and the call back number (e.g., the telephone network identifier of the communication receiving device **50**) in a format compatible for transmission to the selected business communication center's systems. The step **218** of passing the add-to-queue instruction **217** to the queue component **20** of the selected provider is shown in FIG. **8**F. This step includes packaging the SOAP formatted add-to-queue instruction with applicable transport layer and media layer for transmission as discussed above. Upon receipt, the queue component **20** of the selected provider may add the user to the selected queue.

Referring to FIG. **9**, in addition to requesting an expected wait time and callback from the communication system, an embodiment of a system and method for managing, directing, and queuing communication events may also communicate contextual data **900** between a communication device **920** (which includes a session queuing component **922**) and a communication system **940** using, for example, a contextual data routine. The contextual data **900** may be sent to the communication system **940** by itself or along with a callback request. The contextual data **900** can be stored in a storage **924** and can include any information associated with the user

of the communication device, such as name, phone number, address, account number, unique identifier, id number or unique identifier for phone, id number or unique identifier for a car or vehicle, credit score, products and services owned/used, purchase history, GPS or location information, demographics, personal data such as height, weight, shirt size, waist size, shoe size, current medications, etc. The storage **924** can be any memory means, including a memory, such as RAM, ROM or similar types of memory, as well as secondary storage devices, such as a hard disk drive, floppy disk drive, CD-ROM drive, or other types of non-volatile data storage. The contextual data **900** associated with the user can also include for example data about a process, installation or instructions set for example which steps or parts of self-service/technical support steps were performed/completed/not completed, which steps of an installation were completed, or which portion of an instructional manual or process were completed. Also, data about a device or vehicle can be sent as contextual data **900** about or from, for example, a kiosk, point of sale device, airplane ticket machine, automobile, cell phone, etc.

In some embodiments, contextual data **900** is encrypted prior to transmission. For example, various methods of encryption may be used when transmitting contextual data from the user device to a central location or system.

The contextual data **900** of a user that is sent from the communication device **920** or other device to the communication system **940** may allow the communication system **940** to dynamically select a proper list of providers and/or queues that are specific, pertinent, and relevant to the user. As a result, only relevant and pertinent lists of providers and/or queues are displayed to the user. Other providers and queues that are not relevant based on the contextual data **900** are filtered out.

In some embodiments, contextual data **900** is used for authentication. Use of contextual data may also allow the communication system **940** to bypass authentication processes, thus shortening the total interaction time. Systems can either assume that the caller on the communication device **920** is the owner of the device and thus authenticate using device information (such as ID number of the like) or data about a user resident on the device. Alternatively, a system with contextual data capability can present a shortened number of questions or queries for biographical or biometric data for authentication of the current user. For example, contextual data **900** can contain key information about a user of a device which can be used to authenticate the user or the device when a call (or connection) is made from the device. Contextual data **900** may contain one or more phone numbers, pin codes, name, personal identification, personal biographical data or biodata, personal biometric data (e.g. voice print, fingerprint, handprint, iris scan, or the like), credit card number and/or passwords that can be used to authenticate the user.

In some embodiments, for authentication, a user is requested to enter or submit biometric data such as voice, fingerprint, handprint, iris info, etc. Ancillary equipment may be used to obtain the biometrics (such as a fingerprint reader or scanner). This biometric data is transmitted as contextual data **900** to a central system for authentication. The central system compares the received biometric with that on file or in storage. The comparison is used to authenticate the user and provide customized, personalized and/or targeted services.

In an alternative embodiment, personal contextual data **900** is stored on the phone but locked, that is access and the ability to transmit this contextual data **900** from the phone to other devices is available only to a particular user. Contextual data **900** may be stored in encrypted format and only decrypted after it is "unlocked" or proper security measures are cleared. The contextual data **900** can be released from lock-down by various security means or measures such as pin number, personal identification, biometrics and/or password. In one embodiment, the security measure used to release the contextual data from lock down is voice print or voice identification. For example, the user speaks into the device for authentication. More specifically, the words to be spoken may be selected by the device from among a database of voice samples saved for this security purpose. After a voice sample is obtained from the current device user a comparison is made. If a voice match is found, the contextual data **900** is unlocked from the security measures and may be released for use and transmission. If the security measures are not met, the contextual data **900** remains locked and unavailable to the person in possession of the communication device **920**. The contextual data **900** unlocked by voice matching or identification may be transmitted encrypted or unencrypted to a central location or system for use.

In addition, the contextual data **900** of a user/customer may be sent from the communication device **920** or other device to an agent or representative connected to the communication system **940** so that the agent or representative can better assist the user/customer. The contextual data may be maintained or stored in a database in memory for later use.

As also described elsewhere, contextual data **900** flows from the communication device **920** to a communication system **940** as well as from the communication system **940** to the communication device **920**. In certain instances, it may be useful to transmit the contextual data **900** from either the communication device **920** or communication system **940** to a third location. Questions and queries of the user may be sent from the communication system **940** to the communication device **920**. Contextual data **900** to assist, instruct or solve a users problem may also be sent from the communication system **940** or a third location to the communication device **920** for use by the user or communication device **920**.

In one embodiment involving an automobile, the contextual data **900** is used by a caller in an automobile to schedule an appointment for service and repair. The driver/owner of the automobile has a car problem and wishes to speak with the appropriate individual to trouble shoot and advise the driver on steps to be taken. The driver uses a communication device **920** to make contact over the internet to obtain a list of queues and availability. Contextual data **900** about the automobile is received by the central queue location for proper evaluation of the drivers needs. This contextual data **900** may be obtained directly from the automobile through a communication system **940** with the automobile or may be obtained through the communication device **920**. The communication device **920** may communicate directly to or through the automobile or obtain the automobile information through other means such as from the driver. The central communication system **940** uses the contextual data **900** from the car to decide whether the car problem is immediate, urgent or can be addressed through a regularly scheduled visit. With this information, the driver can be provided with the proper queue data. The queue data will provide the estimated wait time or can help schedule a callback time. In the appropriate circumstances, the queue presented to the driver may be for an emergency person or a mechanic. In certain circumstances, an immediate callback may occur.

In another embodiment involving an airline ticket machine, the user needs assistance with a travel problem and has used an airline ticket machine. In this circumstance, when the user requests the queue information, the information about the transaction or attempted transaction at the airline ticket machine is passed to the central location, e.g., communica-

tion system **940**, as contextual data **900**. This data may be transferred in several ways, for example the user can enter an ID number from the airline ticket machine and the central location, using data about the user and the identity of the machine, obtains transaction or attempted transaction information through a look-up of stored data or directly from the machine. The information obtained from the airline ticket machine is then used to determine the appropriate queue and employee to assist the passenger. More specifically, if the user is attempting to change seats one queue or attendant may be most appropriate while if the user was attempting to upgrade to first class a different queue or attendant may be provided. If a flight is full and no seat is being assigned, yet another queue or attendant may be assigned to the passenger.

In another embodiment, a purchaser is calling to place a regular order, such as a monthly prescription order or a monthly supplies order. With contextual data **900** on the purchaser, the central system, e.g., communication system **940**, will determine whether the call appears to be related to a regular standing order and if so make available for listing the appropriate renewal of order queue. When the attendant is on the telephone, all the regular order information will be available to the attendant to speed the process of filling the purchasers anticipated request. Even if another queue is selected by the purchaser, such as trouble shooting, the attendant will have the contextual data **900** available so that the attendant will be aware of he purchasers usual shopping pattern and have some background information available.

In another embodiment involving repair or trouble shooting processes, the contextual data **900** relates to the state or steps in the process that have been completed or attempted. This data can be obtained from the user or directly from the device. It may be obtained from the user through the queue selection interface or from the device through a communication connection such as the internet. Similarly, in an assembly process, contextual data about the serial number of the item and the portions of the item that have been assembled by the user may be sent as contextual data **900**, either by the user or directly through available communications with the device.

Various types of contextual data **900** may be sent from the communication system **940** to the communication device **920**. The data may be related to various administrative, customer accounts, authentication, ordering, accounting, billing, customer equipment, trouble shooting, and customer service issues. Contextual data **900** sent by the communication system **940** may include for example requests for data or information, request for equipment identification information, equipment schematics, equipment parts information, warranty information such as expiration date, instructions, assembly steps, billing information such as payment history, minimum payment date, and last payment date and/or amount, payment methods available, and the like. Various interactions between the communication device **920** and communication system **940** may occur using contextual data. Various interactions with a third location may occur. Various ways of using contextual data **900** are possible, only a few examples are shown.

FIG. **10** is a flow chart illustrating an embodiment of a method **1000** for use with a communication device for selecting a voice call-back. Method **1000** includes sending contextual data to a communication system that selects active queues that are relevant to a user of the communication device based on the contextual data (block **1002**). The contextual data may be created in real-time or recalled from storage. Method **1000** further includes receiving a message including a list of the active queues (block **1004**), causing to be displayed an indication of the list of active queues (block **1006**), obtaining a user selection of a queue as a selected queue using the session queuing component (block **1008**), and communicating the selected queue to the communication system (block **1010**). Method **1000** further includes storing the contextual data in a storage (block **1012**). The contextual data in storage can be newly written, updated with new information or rewritten after a communication transaction or telephone call.

FIG. **11** is a flow chart illustrating an embodiment of a method **1100** for a communication system that receives incoming communications from a communication device, has queues, and will call-back to a communication receiving device. Method **1100** includes receiving, from the communication device, data that includes contextual data and an identifier associated with a communication receiving device (block **1102**), and selecting active queues that are relevant to a user of the communication device based on the contextual data (block **1104**). Method **1100** further includes sending a list of active queues to the communication device (block **1106**), receiving, from the communication device, a selected queue desired for the communication receiving device (block **1108**), and assigning a placeholder for the identifier in the selected queue (block **1110**).

FIG. **12** is a flow chart illustrating an embodiment of a method **1200** for a communication system that receives incoming communications from a communication device, has queues, and will call-back to a communication receiving device. Method **1200** includes receiving an identifier associated with a communication receiving device (block **1202**), receiving contextual data related to a user (block **1204**), and selecting active queues based on the contextual data (block **1206**). Method **1200** further includes sending a list of active queues to the communication device (block **1208**), receiving, from the communication device, a selected queue desired for the communication receiving device (block **1210**), and assigning a placeholder for the identifier in the selected queue (block **1212**).

The above described system represents an exemplary embodiment of a connection system for sequencing communication device identifiers in a selected queue for connection to a service agent of a group of service agents at a business communication center. The present invention includes all such equivalents and modifications, and is limited only by the scope of the following claims.

The invention claimed is:

1. A communication system for managing voice call-back requests from communication devices, comprising:

a processor; and

at least one memory including program code that, when executed by the processor, causes the communication system to:

receive, from a communication device, a request to identify active providers, a request to identify active queues associated with at least one of a plurality of active providers, indication of a selected queue, an identifier associated with a communication receiving device, and data relating to occurrence of a problem;

transmit, to the communication device, an identification of a plurality of active providers and an identification of active queues associated with at least one of the plurality of active providers;

utilize the data relating to occurrence of a problem for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers;

assign a placeholder in the selected queue, the placeholder comprising the identifier associated with the communication receiving device; and

initiate a call-back to the communication receiving device.

2. The communication system of claim **1**, wherein the at least one memory further comprises program code that, when executed by the processor, causes the communication system to utilize at least one of the identifier associated with the communication receiving device, information associated with the communication device, and information associated with the user of the communication device for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers.

3. The communication system of claim **1**, wherein the data relating to occurrence of a problem comprises information associated with the user of the communication device.

4. The communication system of claim **3**, wherein the at least one memory further comprises program code that, when executed by the processor, causes the communication system to decrypt at least a portion of the information associated with the user of the communication device.

5. The communication system of claim **4**, wherein the at least one memory further comprises program code that, when executed by the processor, causes the communication system to authenticate the user of the communication device based on the decrypted information.

6. The communication system of claim **1**, wherein the data relating to occurrence of a problem comprises at least one of information relating to the urgency or severity of the problem and information relating to a device associated with the problem.

7. The communication system of claim **1**, wherein:

the data relating to occurrence of a problem comprises information from which the identity of the problem can be determined; and

the at least one memory further comprises program code that, when executed by the processor, causes the communication system to transmit information relating to a solution of the problem.

8. The communication system of claim **1**, wherein the problem is associated with one of a check out process of online shopping, operation of a gaming console, and ordering of a program using a home entertainment device.

9. A method for managing voice call-back requests from communication devices, comprising:

receiving, from a communication device, a request to identify active providers, a request to identify active queues associated with at least one of a plurality of active providers, indication of a selected queue, an identifier associated with a communication receiving device, and data relating to an occurrence of a problem;

transmitting, to the communication device, an identification of a plurality of active providers and an identification of active queues associated with at least one of the plurality of active providers;

utilizing the data relating to occurrence of a problem for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers;

assigning a placeholder in the selected queue, the placeholder comprising the identifier associated with the communication receiving device; and

initiating a call-back to the communication receiving device.

10. The method of claim **9**, further comprising utilizing at least one of the identifier associated with the communication receiving device, information associated with the communication device, and information associated with the user of the communication device for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers.

11. The method of claim **9**, wherein the data relating to occurrence of a problem comprises information associated with the user of the communication device.

12. The method of claim **11**, further comprising decrypting at least a portion of the information associated with the user of the communication device.

13. The method of claim **12**, further comprising authenticating the user of the communication device based on the decrypted information.

14. The method of claim **9**, wherein the data relating to occurrence of a problem comprises at least one of information relating to the urgency or severity of the problem and information relating to a device associated with the problem.

15. The method of claim **9**, further comprising transmitting instructions for solving the problem, wherein the data relating to occurrence of a problem comprises information from which the identity of the problem can be determined.

16. The method of claim **9**, wherein the problem is associated with one of a check out process of online shopping, operation of a gaming console, and ordering of a program for use with a home entertainment device.

17. A non-transitory, computer-readable medium comprising program code that, when executed by a communication system, causes the communication system to:

receive, from a communication device, a request to identify active providers, a request to identify active queues associated with at least one of a plurality of active providers, indication of a selected queue, an identifier associated with a communication receiving device, and data relating to occurrence of a problem;

transmit, to the communication device, an identification of a plurality of active providers and an identification of active queues associated with at least one of the plurality of active providers;

utilize the data relating to occurrence of a problem for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers;

assign a placeholder in the selected queue, the placeholder comprising the identifier associated with the communication receiving device; and

initiate a call-back to the communication receiving device.

18. The non-transitory, computer-readable medium of claim **17**, wherein the at least one memory further comprises program code that, when executed by the processor, causes the communication system to utilize at least one of the identifier associated with the communication receiving device, information associated with the communication device, and information associated with the user of the communication device for at least one of the identification of a plurality of active providers and the identification of active queues associated with at least one of the plurality of active providers.

19. The non-transitory, computer-readable medium of claim **17**, wherein the data relating to occurrence of a problem comprises information associated with the user of the communication device.

20. The non-transitory, computer-readable medium of claim **19**, further comprising program code that, when executed by the communication system, causes the commu-

nication system to decrypt at least a portion of the information associated with the user of the communication device.

21. The non-transitory, computer-readable medium of claim **20**, further comprising program code that, when executed by the communication system, causes the communication system to authenticate the user of the communication device based on the decrypted information.

22. The non-transitory, computer-readable medium of claim **17**, wherein the data relating to occurrence of a problem comprises at least one of information relating to the urgency or severity of the problem and information relating to a device associated with the problem.

23. The non-transitory, computer-readable medium of claim **17**, wherein the data relating to occurrence of a problem comprises information from which the identity of the problem can be determined.

24. The non-transitory, computer-readable medium of claim **17**, wherein the transmitted data comprises information relating to a solution of the problem.

25. The non-transitory, computer-readable medium of claim **17**, wherein the problem is associated with an order.

26. The non-transitory, computer-readable medium of claim **17**, wherein the problem is associated with operation of a gaming console.

27. The non-transitory, computer-readable medium of claim **17**, wherein the problem is associated with ordering of a program for use with a home entertainment device.

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